Innovative and Sustainable Transportation Evaluation Process (INSTEP) Guidance

**Denver Service Center
Transportation Division**

**National Park Service
U.S. Department of Interior**

DRAFT

Blue Ridge Parkway

Planning Context   :erials and Constru   Visitor Experience   Natural Resources   Innovation   Energy and Climate Change   Cultural Resources

INSIDE COVER

The National Park Service

"To conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

-1916 Organic Act establishing the National Park Service

Great Smokey Mountains National

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INSTEP GUIDANCE DOCUMENT INTENT & CONSIDERATIONS

- This Guidance document:
  - o Provides supporting information that will assist in filling out the checklist
  - o Explains and provides context for the individual criterion
  - o Provides examples (not all inclusive) of strategies and methods for meeting the criteria
  - o Provides possible metrics and measurements relating to the specific criteria
  - o Provides links to additional information or governmental regulations that may illustrate or inform decisions to achieve sustainability

- This guidance document is meant to provide guidance not only in determining the sustainability of certain elements of your project and the overall project, but also to encourage implementation of sustainable methods that were not considered previously.

- Keep the category goal and intent in mind when evaluating individual criterion to continually understand the overall purpose of that specific category.

- The strategies, metrics & measurements, resources, and project examples are not meant to be an exhaustive list, rather they are meant to stimulate your thoughts to promote sustainability to your project.

- Consider the strategies listed as a starting point to develop pertinent, project specific strategies.

- The project examples may not perfectly match your project, but can help you understand how similar projects utilized sustainable features.

- You are encouraged to include innovative features through this tool, which this guidance document can help encourage by promoting new and different ideas not considered before. Innovation is ENCOURAGED!

- Note that trade-offs (intended and unintended) may be necessary. For example, site materials might need to be replaced in kind which would reduce the ability to source locally. Consider the pros and cons of these situations and how they relate to the overall project sustainability.

PURPOSE OF INSTEP

Purpose

National Park Service
Innovative and Sustainable Transportation Evaluation Process (INSTEP)

Since its inception in 1916, the National Park Service (NPS) has been a world leader in protecting natural and cultural resources, fostering environmental stewardship and providing for visitor enjoyment of the unique NPS resources. Transportation and travel within our national parks is an inextricable element of visitor experience and enjoyment and resource protection. The NPS strives to achieve sustainable management of all facilities and operations including over 67,000 structures and approximately 8,000 miles of roads, bridges, tunnels, and trails.

As green infrastructure rating systems have developed and grown in use, so has the NPS's interest in capturing existing sustainability practices and encouraging innovations in sustainability. The NPS Denver Service Center, Transportation Division (DSC-T) researched and tested multiple green infrastructure rating systems for applicability to NPS transportation projects and systems, and found that none of them adequately addressed the agency's unique regulatory framework and goals.

As a result of these findings the NPS has embarked on the development of INSTEP, a sustainable transportation rating system unique to the NPS. The INSTEP will be unique in a number of ways. INSTEP's most important function will be to educate and share sustainable transportation practices across the NPS, with partners and other agencies. NPS project teams will be able to search, learn and employ sustainable ideas and techniques developed and used by other projects. INSTEP will help measure a transportation project's sustainable progress with itself rather than against other projects. INSTEP will also challenge project teams and track sustainable quantitative and qualitative outcomes within projects.

A SECOND-CENTURY NATIONAL PARK SERVICE:

Connects People to Parks and helps communities protect what is special to them, highlight their history, and retain or rebuild their economic and environmental sustainability.

Advances the Education Mission by strengthening the NPS role as an educational force based on core American values, historical and scientific scholarship, and unbiased translation of the complexities of the American experience.

Preserves America's Special Places and is a leader in extending the benefits of conservation across physical, social, political, and international boundaries in partnership with others.

*Enhances Professional and Organizational Excellenc*e by adapting to the changing needs of visitors, communities, and partners; encouraging organizational innovation; and giving employees the chance to reach their full potential.

Alternative Transportation:

Alternative transportation systems (ATS) help park units minimize resource impacts where traffic volume on existing roadway infrastructure has reached or is over capacity. These systems are important to the National Park Service (NPS) and its visitors: they contribute to preserving resources, including improvements to air quality, sound scapes, and reduced wildlife/auto collisions. These systems also demonstrate leadership in using alternative transportation to reduce fossil fuel consumption and greenhouse gas emissions.

NPS passenger boardings are on par with mid-sized U.S. cities. NPS transit systems accommodated 26.9 million passenger boardings in CY2013.

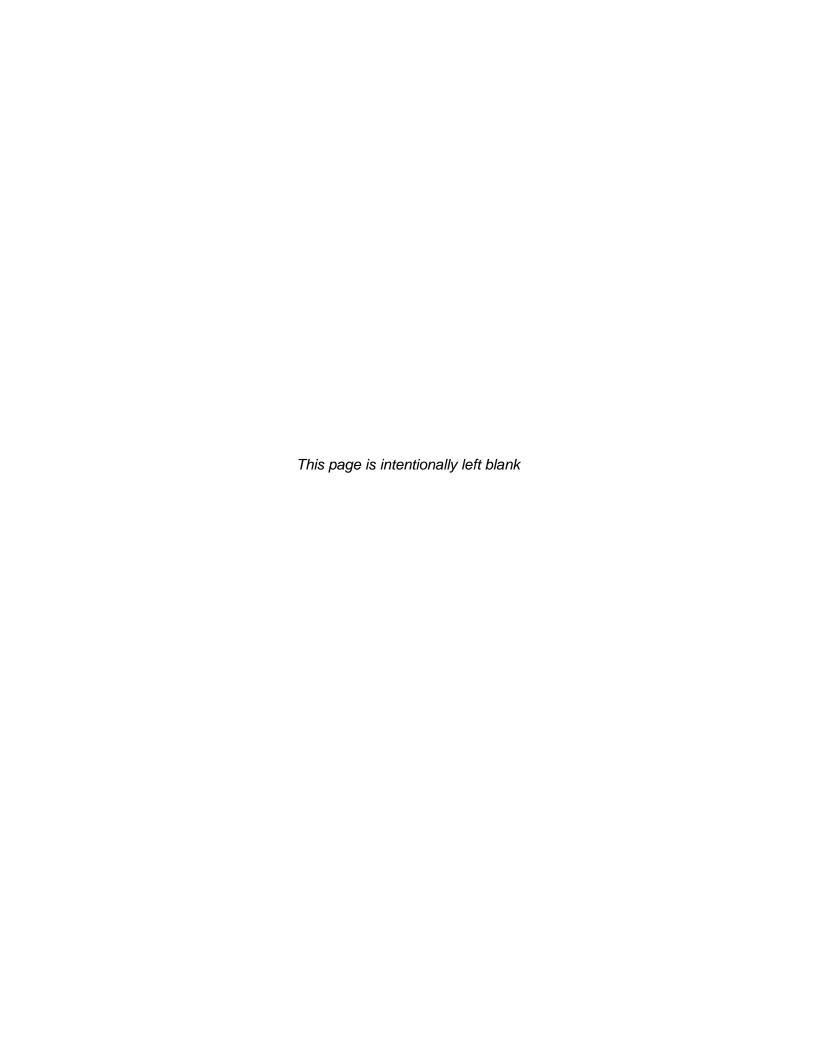NPS currently has 131 alternative transportation systems in 66 park units nationwide. The systems are provided through contractual, concession and/or partnership agreements. Twenty (15%) systems are owned and operated by the NPS, 84 (64%) are contracted by the NPS through concession contracts, 12 (9%) are operated by service contracts, and 15 (12%) are provided under cooperative agreements with public or private partners.

GOALS OF INSTEP

NPS National Long Range Transportation Plan (NLRTP) Goals	INSTEP Goals
Facility Management - *Sustainably manage NPS transportation facilities and services*	• Improve operational efficiency and reliability. • Provide educational opportunities on sustainability to employees. • Incorporate methods and materials that ensures system longevity.
Financial Planning - *Allocate available transportation funding wisely*	• Optimize allocation of financial resources to meet mission critical objectives. • Reduce life-cycle costs and resource consumption. • Encourage new and innovative approaches to sustainable design, and how we operate and maintain our facilities.
Resource Protection - *Protect and preserve natural and cultural resources*	• Protect, enhance, and restore cultural and natural resources. • Conserve natural resources to the maximum extent practicable.
Visitor Experience - *Maintain and enhance the quality of visitor experiences*	• Provide for visitor enjoyment and access. • Provide equitable benefits and access to employees and the public to the maximum extent possible. • Provide educational opportunities on sustainability to the public.
Safety - *Provide a safe transportation system for all users*	• Protect public and employee health, safety and welfare.

INSTEP Design and Construction - Categories and Criteria

Project Planning Context (PC)

☐	PC-1	Alignment and Site Selection
☐	PC-2	Context-Sensitive Design
☐	PC-3	Resiliency
☐	PC-4	Financial Sustainability and Total Cost of Facility Operations (TCFO)
☐	PC-In	Innovation and Custom Strategies

Natural Resources (NR)

☐	NR-1	Fish and Wildlife
☐	NR-2	Vegetation
☐	NR-3	Soils and Geologic Resources
☐	NR-4	Invasive Species
☐	NR-5	Water Resources
☐	NR-6	Soundscape and Acoustic Resources
☐	NR-7	Dark Sky Preservation
☐	NR-In	Innovation and Custom Strategies

Cultural Resources (CR)

☐	CR-1	Historic and Prehistoric Structures
☐	CR-2	Archaeological Resources
☐	CR-3	Cultural Landscape
☐	CR-4	Ethnographic Resources
☐	CR-In	Innovation and Custom Strategies

Visitor Experience (VE)

☐	VE-1	Safety
☐	VE-2	Visual Resources
☐	VE-3	Connectivity
☐	VE-4	Accessibility
☐	VE-5	Education and Outreach
☐	VE-6	Local Economy
☐	VE-In	Innovation and Custom Strategies

Energy and Climate Change (EC)

☐	EC-1	Air Quality
☐	EC-2	Recycling
☐	EC-3	Heat Island
☐	EC-4	Energy Consumption
☐	EC-In	Innovation and Custom Strategies

Materials and Construction (MC)

☐	MC-1	Material Selection
☐	MC-2	Waste Management
☐	MC-3	Construction Practices
☐	MC-4	Quality Control
☐	MC-5	Noise and Vibration
☐	MC-In	Innovation and Custom Strategies

Innovation and Custom Strategies (IN)

☐	IN-1	Project Specific Sustainable Practices

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Glacier National Park

PC-1: Alignment and Site Selection

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Plan and design alignments and sites to preserve, maintain, or restore park resources.

Strategies:
1. Maximize highest and best use of existing infrastructure.
2. Use existing road alignments or previously used road alignments.
3. Avoid sites lower than 5 ft. above 100 year flood plain.
4. Avoid sites that are major wildlife migration routes.
5. Select sites and alignments that minimize cut and fill.
6. Recognize and understand the site context.
7. Avoid natural hazards.
8. Retain as much existing native vegetation as possible to secure the integrity of the site.
9. Determine the carrying capacity of the site based on the sensitivity of site resources and the ability of the land to regenerate.
10. Avoid developing land that is habitat for threatened or endangered species.
11. Avoid land that is within 100 ft. of wetlands, water courses or major drainage ways.

Metrics & Measurements:
1. Percentage of alignment or footprint re-used.
2. Percentage of project area occurring on previously disturbed land.
3. Consistency with appropriate National Long Range Transportation Plan (NLRTP) and other higher level planning documents.

Resources:
Laws, Policies and Regulations:
Executive Order: 13514 (Section 2, Part F)
http://www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf

Other Guidance:
National Park Service Transportation Planning Guidebook 1999
http://www.nps.gov/transportation/pdfs/transplan.pdf
National Park Service Roadway Design Standards (Same as 1984 Park Road Standards)
http://www.nps.gov/policy/DOrders/parkRoadStandards.pdf
NPS Transportation website for wide-range of documents
http://www.nps.gov/transportation/index.html
Grand Teton National Park - Context Sensitive Solutions (CSS) in the Federal Lands Highway Program
http://www.youtube.com/watch?v=dx7RrhCRRTs
ARC Wildlife Crossing Design Competition

https://www.youtube.com/watch?v=bCJ0qvIW5Mc&index=2&list=PL8332D998D92451DE
FHWA Statewide Pedestrian and Bicycle Planning Handbook
http://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/pedestrian_bicycle_handbook/fhwahep14051.pdf

Project Examples:
- Yellowstone (YELL) – Protect Gibbon River, natural resources
- Bryce Canyon (BRCA) – Protect cultural resources of Aztec Ruins
- Sequoia and Kings Canyon (SEKI) – Bridge to restore meadow
- North Cascades (NOCA) – Stehikan Road
- Rocky Mountain (ROMO) – Bear Lake Road realignment

Definitions of Terms and Acronyms:
Resiliency: Minimizing the vulnerability of transportation systems from a variety of disruptions, and adapting transportation systems to climate change impacts.
RRR (3R): Resurfacing, Restoration, and Rehabilitation.
Site Selection: The process of site selection for sustainable developments is one of identifying, weighing, and balancing the attractiveness (natural and cultural environments, access) of a site against the cost inherent in its development (natural and cultural environments, access, hazards, energetics, and operations). *Source: NPS Guiding Principles of Sustainable Design September 1993 Resource Protection*

PC-2: Context Sensitive Design

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and the public to the maximum extent possible. Provide educational opportunities on sustainability to the public.

Criterion Intent:
Design the project to respond to the unique character or sense of place (built and natural environment).

Strategies:
1. Design project with the intrinsic qualities of the regional landscape in mind, including review of existing park documents related to design, zoning, cultural landscape treatment plans and similar documents.
2. Consider the needs and experience of all road users.
3. Align project in harmony with the park landscape and park resources.
   - Consider materials (scale, color, texture) that speak to the site context.
   - Select site materials and details that are appropriate for the site by reflecting site context.
4. Lay lightly on the land.

Metrics & Measures:
1. Work with resource staff and seek out technical expertise.
2. Visual Assessment, e.g. USFS, BLM.
3. Was an FHWA Context Sensitive Solutions (CSS) process followed?

Resources:
Laws, Policies and Regulations:
23 U.S. Code § 217 - Bicycle transportation and pedestrian walkways
http://www.law.cornell.edu/uscode/text/23/217

Other Guidance:
Grand Teton National Park – Context Sensitive Solutions (CSS) in the Federal Lands Highway Program
https://www.youtube.com/watch?v=dx7RrhCRRTs
National Park Service Context Sensitive Design Guidance
http://contextsensitivesolutions.org/network/one?party_id=7158
National Park Service Roadway Design Standards
http://www.nps.gov/policy/DOrders/parkRoadStandards.pdf
Park Roads and Parkways Program Handbook (Scroll to page 59)
http://www.nps.gov/features/dscw/88_PRPPHandbook/documents/PRPPHandbook_AllPages_Jan2008.pdf
NPS Context Sensitive Solutions (CSS)
http://www.nps.gov/transportation/fact_sheet_context_sensitive_solutions.html
FHWA Context Sensitive Solutions (CSS)
http://contextsensitivesolutions.org/

NCHRP Report 480: A Guide to Best Practices for Achieving Context Sensitive Solutions (CSS).
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_480a.pdf
NCHRP Document 69 Performance Measures for Context Sensitive Solutions (CSS) – A Guidebook for State DOTs
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w69.pdf
FHWA Statewide Pedestrian and Bicycle Planning Handbook
http://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/pedestrian_bicycle_handbook/fhwahep14051.pdf

Project Examples:
- Yellowstone (YELL) – Gibbon Canyon bridges
- Zion (ZION) – Historic bridge abutments, roadway surface treatment
- Glacier (GLAC) – Removable guardrail, reinforced guard wall

Definitions of Terms and Acronyms:
Context sensitive design: Incorporating natural and cultural resource considerations into all aspects of transportation decision-making to avoid, minimize or mitigate negative resource impacts.
Context sensitive solutions (CSS): "A collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist." -- *Federal Highway Administration (FHWA)*

PC-3: Resiliency

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Appropriate consideration of natural disasters and climate change impacts.

Strategies:
1. If an asset needs to be built or rebuilt, ensure that it is mitigated using sound, sustainable and resilient materials, methods and practices.
2. Perform a site analysis to avoid areas of high risk for flooding, rockfall, and other natural hazards.
3. Design facilities to locate occupied areas above flood level, allow flow-through of floods and incorporate materials which can withstand water. (Solid structures with removable boardwalks and docks).
4. Consider temporary facilities and/or natural materials where facilities are needed in high risk areas (e.g. shell parking lots in beachfront areas).
5. Consider protection of structures which could include "hard" structures such as seawalls or revetments and "soft" strategies such as beach nourishment and vegetation plantings.
6. Accommodate sea level change, higher water levels, etc. by: increasing bridge deck elevations and strengthen bridge structures, lowering roadway profiles to allow overwash without pavement damage during extreme events or raising tunnel portal walls to reduce likelihood of flooding.
7. Consider relocation of permanent assets from high risk areas, including: relocating infrastructure further inland away from the coastline, repurposing or reclassifying paved road to all-terrain vehicle road or reconditioning a damaged vehicular bridge to serve as a pedestrian bridge or fishing pier.
8. Consider increasing redundancy of systems.
9. Consider potential damage of infrastructure from the following sources: roadway damage by wave attack, roadway and railway damage by coastal "weir-flow," roadway damage by bluff erosion and shoreline recession, bridge deck damage by waves on surge, structure damage by wave run-up, tunnel and road damage by overtopping, and damage by tsunamis.

Metrics & Measurements:
1. Was risk analysis performed for climate change and natural hazards?

Resources:
Laws, Policies and Regulations:
Highways in the Coastal Environment: Assessing Extreme Events
http://www.fhwa.dot.gov/engineering/hydraulics/pubs/nhi14006/nhi14006.pdf
USDOT Climate Adaptation Plan 2014
http://www.dot.gov/sites/dot.gov/files/docs/2014-%20DOT-Climate-Adaptation-Plan.pdf

Executive Order 11988: Floodplain Management
http://www.fema.gov/environmental-planning-and-historic-preservation-program/executive-order-11988-floodplain-management
Executive Order: Preparing the United States for the Impacts of Climate Change
http://www.whitehouse.gov/the-press-office/2013/11/01/executive-order-preparing-united-states-impacts-climate-change
NPS Policy Memorandum 15-01: Addressing Climate Change and Natural Hazards for Facilities
http://www.nps.gov/policy/PolMemos/PM_15-01.htm

Other Guidance:
National Park Service Climate Change Action Plan
http://www.nature.nps.gov/climatechange/docs/NPS_CCActionPlan.pdf
NPS Directive: Cultural Resource Management for Sustainability and Resiliency
NPS - Please provide a web address for this resource
NPS Siting and Design Standards
http://www.nps.gov/dscw/dstandards.htm
NPS Climate Change Response Strategy
http://www.nature.nps.gov/climatechange/docs/NPS_CCRS.pdf
FHWA: Highways in Coastal Environment: Assessing Extreme Events
http://www.fhwa.dot.gov/engineering/hydraulics/pubs/nhi14006/nhi14006.pdf
U.S. Department of Transportation Climate Adaptation Plan
http://www.dot.gov/sites/dot.gov/files/docs/2014-%20DOT-Climate-Adaptation-Plan.pdf
FHWA: Climate Adaptation Resources
http://www.fhwa.dot.gov/environment/climate_change/adaptation/
NPS Policy Memorandum 12-02: Applying National Park Service Management Policies in the Context of Climate Change
http://www.nps.gov/policy/MPandCC.pdf
NPS Handbook - Addressing Climate Change and Natural Hazards for Facilities Handbook
http://www.nps.gov/subjects/climatechange/upload/PM_15-01_Climate_Change_and_Facilities_1-20-2015.pdf
U.S. Global Change Research Program
http://www.globalchange.gov/
NPS Climate Change
http://www.nps.gov/subjects/climatechange/index.htm
FHWA Climate Change Adaptation Case Studies
http://www.fhwa.dot.gov/environment/climate_change/adaptation/case_studies/
NPS Addressing Climate Change and Natural Hazards Facility Planning and Design Considerations; Stop 1: Natural Hazard Checklist (Excerpt: Level 3 Handbook)
(Hard copy only. Link will be updated once db implemented)

Project Examples:
- Assateague Island (ASIS) – parking lots
- Statue of Liberty (STLI), Ellis Island (ELIS), and Great Kills (no abbreviation) dock facilities
- North Cascades (NOCA) – Stehekin Road realignment
- Any Emergency Relief for Federally Owned Roads (ERFO) projects – Resiliency
- Assateague Island (ASIS) – Moving the South Beach parking area - PMIS 201451

- Fire Island (FIIS) – Boardwalks - Emergency Relief for Federally Owned Roads (ERFO) 201446 and NPS Sandy 195-75
- Gateway (GATE) – Holly Forest at Sandy Hook – Emergency Relief for Federally Owned Roads (ERFO) - 201454 and NPS Sandy 195426
- Gateway (GATE) – Great Kills Marina - Emergency Relief for Federally Owned Roads (ERFO) - 197271 - a little from NPS, but mostly all Emergency Relief for Federally Owned Roads (ERFO)
- Statue of Liberty (STLI) – Docks - Emergency Relief for Federally Owned Roads (ERFO) - 201986 and 201473 - NPS Sandy 195104

Definitions of Terms and Acronyms:

Resiliency: Minimizing the vulnerability of transportation systems from a variety of disruptions, and adapting transportation systems to climate change impacts.

PC-4: Financial Sustainability and Total Cost of Facility Operations (TCFO)

INSTEP Goal:
Financial Planning – Optimize allocation of financial resources to meet mission critical objectives. Consider life-cycle costs and resource consumption. Encourage new and innovative approaches to sustainable design, and how we operate and maintain our facilities.

Criterion Intent:
Consider the life-cycle costs of the transportation asset. Develop projects with overall life cycle costs as part of the design criteria. Ensure project selection and design is made with operations and maintenance in mind. Maintain critical facilities and services in good operating conditions through targeted investment.

Strategies:
1. Reduce/optimize life-cycle cost requirements.
2. Perform Value Engineering/Value Analysis using life-cycle costs.
3. Addresses highest priority assets/infrastructure as identified in the Park Asset Management Plan.
4. Incorporate Capital Investment Strategy into prioritization and programming decisions by focusing investment on high priority assets.
5. Prioritize cyclic and preventive maintenance in order to extend interval between major rehabilitation projects (and associated environmental impacts).
6. Consider disposition of low priority assets to reduce ongoing expenditures.
7. Understand that not using a specific sustainable design strategy because it is not financially sustainable can be considered a sustainable strategy.

Metrics & Measurements:
1. Track whether projects conducted Value Engineering/Value Analysis using life-cycle costs.
2. Did the selected alternative have the best life-cycle costs, and if not, why not?
3. Track financial sustainability score from CIS for transportation projects. Evaluate what target score for financial sustainability should be after tracking projects for some period of time (e.g. 2 years).
4. Cost of maintenance / O&M manual.

Resources:
Laws, Policies and Regulations:
Executive Order #13327: Federal Real Property Asset Management - February 4, 2004
http://www.gsa.gov/portal/content/101584
Directors Order #90: Value Analysis
http://www.nps.gov/policy/DOrders/DO90.htm
Directors Order #80: Real Property Asset Management
http://www.nps.gov/policy/DOrders/DOrder80.htm

Other Guidance:
The NPS and Transportation Asset Management
http://www.nps.gov/transportation/the_nps_and_tam.html
Capital Investment Strategy Guidebook
NPS - Please provide a web address for this resource
NPS Total Cost of Facility Ownership
http://www.nps.gov/transportation/cost_of_ownership.html
Reference Manual #80: Real Property Asset Management
http://www.nps.gov/policy/DOrders/DOrder80.htm
OMB Circular 131
http://www.whitehouse.gov/sites/default/files/omb/assets/OMB/circulars/a131/a131-122013.pdf
Capital Investment Strategy (CIS) and Federal Lands Transportation Program
NPS - Please provide a web address for this resource
Regional Pavement Preservation Plans
NPS - Please provide a web address for this resource

Project Examples:
N/A

Definitions of Terms and Acronyms:
Financial sustainability: Supports the economic triple bottom line sustainability principle by improving economic prosperity for current and future generations and ensuring that there are sufficient financial resources to advance the projects that help achieve broader goals of the community. *Source: FHWA Advancing a Sustainable Highway System: Highlights of FHWA Sustainability Activities; June 2014; Prepared by: Center for Transportation Policy and Planning, John A. Volpe National Transportations Systems Center*
Total Cost of Facility Operations (TCFO): TCFO analysis is to find the lifetime costs of acquiring and operating a facility or asset. TCFO analysis is based on the notion that there can be a large difference between the initial price of something and its long-term costs. Decisions should be based on the total cost of ownership over time, not just the initial costs. *Source: NPS: http://www.nps.gov/transportation/cost_of_ownership.html*

Yellowstone National Park

NR-1: Fish and Wildlife

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Protect and maintain animal populations and sensitive habitats. Consider transportation system design, construction, and future maintenance methods that meet park management objectives for protecting fish and wildlife and their habitats. Transportation systems can directly affect animals through mortality (e.g. wildlife-vehicle collisions), travel way avoidance, habitat loss, and habitat fragmentation.

Strategies:
1. Identify and protect federal, state and locally listed species.
2. Identify and protect and/or restore sensitive habitat (e.g. nesting areas, spawning habitat, etc.).
3. Identify and protect and/or restore corridors for animal movements (e.g. improve habitat connectivity, warning and safety systems for drivers).
4. Provide and enhance terrestrial wildlife crossings.
5. Provide and enhance aquatic organism crossings (e.g. replace or widen stream crossing structures).
6. Use context sensitive design in protecting natural resources.
7. Follow mitigation measures outlined in compliance documents.
8. Build multi-disciplinary team including natural resources experts.
9. Identify spawning or mating (or other) seasons that leave fish or wildlife vulnerable and avoid potential disruptive activities in sensitive areas.

Metrics & Measurements:
1. Area of fish and wildlife habitat restored or protected.
2. Number of fish and wildlife crossings added or enhanced (e.g. number of barriers removed).
3. Length or area of stream habitat connected by new or enhanced crossings.
4. Area of wildlife habitat connected by new or enhanced crossings.
5. Change in animal distribution along visitor travel routes.
6. Change in animal movements at crossings.
7. Decrease in wildlife vehicle/visitor encounters.

Resources:
Laws, Policies and Regulations:
Bald and Golden Eagle Protection Act
http://www.fws.gov/midwest/midwestbird/eaglepermits/bagepa.html
Clean Water Act
http://www2.epa.gov/laws-regulations/summary-clean-water-act
Endangered Species Act
http://www.fws.gov/endangered/laws-policies/

Executive Order: Recreation Fisheries
http://water.epa.gov/lawsregs/guidance/wetlands/eo12962.cfm
Fish and Wildlife Coordination Act
http://www.fws.gov/laws/lawsdigest/fwcoord.html
Migratory Bird Treaty Act
https://www.fws.gov/laws/lawsdigest/migtrea.html
2006 NPS Management Policies (Section 4.4.1.2)
http://www.nps.gov/grca/naturescience/upload/MP2006.pdf
National Environmental Policy Act
http://www.epa.gov/compliance/nepa/
FWS Rivers and Harbors Act
https://www.fws.gov/laws/lawsdigest/RIV1899.HTML
Sustainable Fisheries Act, amendment to Magnuson-Stevens Act
http://www.nmfs.noaa.gov/sfa/sustainable_fishereries_act.pdf

Other Guidance:
USFWS Roadway Design Guideline (2011)
http://www.transwildalliance.org/resources/20114211913.Pacific.Region.Roadway.Design.Guidelines.pdf
FHWA Design for Fish Passage at Roadway- Stream Crossings (2007)
http://www.fhwa.dot.gov/engineering/hydraulics/pubs/07033/07033.pdf
FHWA Wildlife Vehicle Collision Reduction Study, Best Practices Manual (2008)
http://environment.fhwa.dot.gov/ecosystems/wvc/index.asp
NPS Director's Order 77 – Wetland Protection
http://www.nature.nps.gov/water/wetlands/assets/docs/DO_77-
1_PROC_MANUAL_2012_Revision_FINAL.pdf
NPS Director's Order 75 – Natural Resources Inventory and Monitoring
http://www.nature.nps.gov/nps75/nps75.pdf
NPS Integrated Resource Management Applications Portal
https://irma.nps.gov/App/Portal
USFS Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings (2008)
http://www.fs.fed.us/eng/pubs/pdf/StreamSimulation/
Transportation Research Board Evaluation of the Use and Effectiveness of Wildlife Crossings, National Cooperative Research Program Report 615 (2008)
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_615.pdf

Project Examples:
- Great Smoky Mountains (GRSM) – Sparks Lane culvert replacements for fish passage
- Mount Rainier (MORA) – Tahoma Road culvert replacement

Definitions of Terms and Acronyms:
Travel Way Avoidance: To reduce unnecessary travel by adjusting schedules to beat high traffic volume times, or using technologies (such as teleconferences) to avoid the need for travel at all.
Habitat Connectivity: Habitat connectivity is the degree to which the landscape facilitates animal movement and other ecological flows. Wildlife need to move – Mobility is the key to survival for many wildlife species. *Source: Washington State Department of*

Transportation   http://www.wsdot.wa.gov/NR/rdonlyres/6FD6F8A9-A73D-49E5-A29B-1626B639FC7F/0/HabitatConnectivity.pdf

<u>Habitat Connectivity</u>:   The process by which habitat loss results in the division of large, continuous habitats into smaller, more isolated remnants. *Source: http://www.els.net/WileyCDA/ElsArticle/refId-a0021904.html*

<u>Wildlife/Organism Crossing</u>:

When terrestrial organisms attempt to cross roadways in order to meet life requisites. *Source: USFWS*

NR-2: Vegetation

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Protect, maintain or restore plant communities to preserve genetic, ecological and/or cultural integrity consistent with management objectives. Identify and implement designs and construction methods that avoid desirable vegetation, or restore appropriate, vigorous plants and self- sustaining vegetation communities. Opportunities may exist to repair or restore historic damage to vegetation communities such as revegetating cut slopes where topsoil was not salvaged and replaced or closing and restoring borrow pits, or stockpile areas.

Strategies:
1. Identify and protect rare plants.
2. Identify and protect native plant communities.
3. Identify, avoid and protect vegetation appropriate to the park setting (e.g. ethnographically significant sacred plants, native plants, historically appropriate plantings, etc.).
4. Avoid threatened and endangered species. If avoidance is not possible plants that will be disturbed should have viable seed collected, and transplanted outside of disturbance.
5. Establish construction boundaries to minimize disturbance of the existing site.
6. Restore previously degraded areas to their natural state.
7. Select appropriate, native, or historically appropriate plants for restoration or revegetation.
8. Propagate and increase locally collected seed or cuttings.
9. Prohibit plants listed as invasive or noxious weed species.
10. Avoid monoculture.
11. Provide appropriate seed or planting bed preparation.
12. Use context sensitive design in protecting natural resources.

Metrics & Measurements:
1. Area of disturbance restored to a native or culturally appropriate plant community.
2. 5 years out plant community is self-sustaining with few invasive plants measured in numbers of species, and percent cover.
3. Carbon sequestration.
4. Maintenance needs reduction: irrigation, fertilizer, mowing.

Resources:
Laws, Policies and Regulations:
Endangered Species Act
http://www.fws.gov/endangered/laws-policies/
Executive Order 11987: Exotic Organisms

http://www.archives.gov/federal-register/codification/executive-order/11987.html
Executive Order 13112: Invasive Species
https://www.doi.gov/sites/doi.gov/files/migrated/invasivespecies/upload/Five-Year-Review-FINAL-PRINT-VERSION.pdf
Presidential Memorandum: Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators
https://www.whitehouse.gov/the-press-office/2014/06/20/presidential-memorandum-creating-federal-strategy-promote-health-honey-b

Other Guidance:
The Landscape Architecture Foundation—Fast Facts
http://landscapeperformance.org/fast-fact-library
The Landscape Architecture Foundation—Benefits Toolkit
http://landscapeperformance.org/benefits-toolkit
Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes (pp.13, VII)
http://www.whitehouse.gov/sites/default/files/microsites/ceq/recommendations_on_sustainable_landscaping_practices.pdf
2006 NPS Management Policies (Section 4.1, 4.4, and 9.1.3.2)
http://www.nps.gov/policy/mp2006.pdf
i-Tree Software by the USDA
http://www.itreetools.org/index.php
Roadside Revegetation: An Integrated Approach to Establishing Native Plants. FHWA. 2007.
http://flh.fhwa.dot.gov/about/css/documents/rr-manual.pdf
USFS Fire Effects Information System
http://www.feis-crs.org/beta/faces/SearchByOther.xhtml
Plants Database USDA Natural Resources Conservation Service
http://plants.usda.gov/java/
Sustainable Sites Initiative
http://www.sustainablesites.org/
Lady Bird Jonson Wildflower Center at the University of Texas Austin
http://www.wildflower.org/plants/
NPS Revegetation Program Sustainability Fact Sheet

Project Examples:
- Yellowstone (YELL) – All completed phases Grand Loop Road reconstruction
- Rocky Mountain (ROMO) – Bear Lake Road phase 1 & 2
- Sequoia & Kings Canyon (SEKI) – General's Highway phases 1-13
- Golden Gate (GOGA) – Conzelman Road
- Big Bend (BIBE) – Repair drainage structure at Todd Hill
- Stones River (STRI) – Improvements to the self-guided tour routes

Definitions of Terms and Acronyms:
N/A

NR-3: Soils and Geologic Resources

INSTEP Goal:
Protect, maintain or restore soils and geologic resources to preserve ecological and/or cultural integrity consistent with management objectives.

Criterion Intent:
To design and manage transportation systems to protect soil, geologic features and processes, while minimizing potential for damage caused by natural geologic hazards (e.g. erosion). Identify and implement designs and construction methods that avoid undisturbed soils, maintain soil function where disturbance is unavoidable, or restore soil function when it has been previously disturbed or destroyed. Native topsoil characteristics often include significant rock and/or gravel, low nutrient content, a shallow A horizon, and/or other characteristics that are significantly different from agricultural topsoil. Native plants are adapted to undisturbed native soils. Topsoil is defined as the A horizon and above. There may be situations with severe noxious weed infestations when topsoil would not be salvaged or re-used in order to destroy the seed bank.

Strategies:
1. Identify and preserve geologic resources (including geologic processes, materials, landforms, fossils, and caves) in their natural condition.
2. Obtain best available information about geologic resources and hazards affected by transportation system.
3. Locate, design, and maintain transportation systems to avoid or minimize their susceptibility to geologic hazards.
4. Use techniques that accommodate natural geologic processes (e.g. use culvert and bridge designs that minimize impedance of floodplain processes).
5. Maximize re-use of excavated materials.
6. Minimize the import of construction materials.
7. Obtain borrow material from authorized and permitted sites.
8. Identify soils and soil function pre-disturbance.
9. Identify depth of topsoil for salvage where appropriate.
10. Do not mix topsoil with sub-soils.
11. Minimize movement of topsoil from the location from which it is salvaged.
12. Do not over water topsoil.
13. Do not store topsoil in stockpiles over 36 inches in depth.
14. When topsoil is needed but not available, develop strategy to replicate the soil function.
15. Control unnatural erosion using BMPs.

Metrics:
1. Stable soils supporting appropriate or native vegetation.
2. Transportation components that protected geologic resources or avoided/minimized susceptibility to geologic hazards.

Resources:
Laws, Policies and Regulations:
Federal Cave Resources Protection Act
http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/recreation_images/natio
nal_programs/caves___karst.Par.39979.File.dat/Cavelaw.pdf
2006 NPS Management Policies (Section 4.8)
http://www.nps.gov/policy/mp2006.pdf

Other Guidance:
Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes
(pp.8, V)
https://www.whitehouse.gov/sites/default/files/microsites/ceq/recommendations_on_sustainable_landsca
ping_practices.pdf
National Park Service Soil Management
http://www.whitehouse.gov/sites/default/files/microsites/ceq/recommendations_on_sustainable_landscapi
ng_practices.pdf
Roadside Revegetation: An Integrated Approach to Establishing Native Plants. FHWA.
2007.
http://flh.fhwa.dot.gov/about/css/documents/rr-manual.pdf
Natural Resources Conservation Service Soil Site
http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/
USGS Introduction to Biological Soil Crusts
http://www.soilcrust.org/crust101.htm
NPS Natural Resource Management Reference Manual #77 - Geologic Resources
Management; Paleontological Resources Management; Administrative Uses of
Resources
http://www.nature.nps.gov/rm77/

Project Examples:
N/A

Definitions of Terms and Acronyms:
Natural Resources: Materials and components that come from the environment, such
as land, forests, mineral deposits, water, etc.

NR-4: Invasive Species

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Prevent the introduction of new invasive species. Prevent expansion or reduce existing invasive species population. Identify and implement designs and construction methods that prevent or minimize invasive species populations or habitat.

Strategies:
1. Prevent the spread of existing invasive species.
2. Eliminate existing invasive species.
3. Prevent the introduction and establishment of invasive species in accordance with park's Integrated Pest Management Plan.
4. Clean vehicles from soil and debris that contain seed or propagates before entering the park or construction site and when leaving the construction site or park.
5. Inspect construction vehicles and equipment for cleanliness.
6. Do not relocate topsoil from locations where is was salvaged.
7. Pre-treat invasive plants for 2 years previous to construction to reduce seed bank.
8. Treat disturbed area for 2 years after construction disturbance to prevent establishment of invasive plants.
9. Do not move water from untreated sources between drainages.
10. Do not use untreated water.
11. Maintain communication with park specialists.
12. Follow park guidance regarding invasive species.
13. Provide visitors, employees, and contractors with cleaning stations.
14. Use context sensitive design in protecting natural resources.

Metrics & Measurements:
1. Research and collect pre-project measurements of the invasive species population or habitat. Evaluate design and proposed construction methods using the same system to reduce invasive species numbers or habitat.

Resources:
Laws, Policies and Regulations:
Executive Order 13112: Invasive Species
https://www.doi.gov/sites/doi.gov/files/migrated/invasivespecies/upload/Five-Year-Review-FINAL-PRINT-VERSION.pdf

Other Guidance:
The National Invasive Species Council (NISC) 2008 - 2012 Management Plan
http://www.invasivespeciesinfo.gov/council/mp2008.pdf
National Invasive Species Information Center (NISC)
http://www.invasivespeciesinfo.gov/index.shtml
National Park Service Invasive Species Management
http://www.nature.nps.gov/biology/invasivespecies/EPMT_teams.cfm

2006 NPS Management Policies (Section 4.4.4)
http://www.nps.gov/policy/mp2006.pdf
NPS: Invasive Species Management Resources
http://www.nature.nps.gov/biology/invasivespecies/

Project Examples:

- NATR PMIS 55898 Bogue Chitto Wetland Mitigation – Approximately 4 acres of abandoned agricultural land was restored to a hardwood bottomlands wetland to mitigate wetlands impacted by the construction of a multi-use trail adjacent to the parkway motorway near Jackson MS. The site was overgrown with non-native invasive plants that were treated mechanically and chemically and the site was then seeded and planted with native plants to out compete invasive plants.

Before site work had started.

During invasive plant removal and control.

After invasive plant control, seeding and planting.

Definitions of Terms and Acronyms:

Invasive Species: "A non-native species whose introduction does, or is likely to cause, economic or environmental harm or harm to human, animal, or plant health." *Source: Executive Order 13112, 1999.*

Invasive species include all taxa of species from pathogens (whirling disease) and microscopic insects, to non-native inappropriate plants (Canada thistle), mollusks (quaga and zebra mussels), to feral mammals (feral pigs). Transportation corridors including roads, paths, waterways and recreation areas are significant contributors to the spread and establishment of invasive species.

NR-5: Water Resources

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources.
Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Protect, restore or maintain water resources.

Strategies:
1. Identify and document existing water resource conditions.
2. Restore previously degraded lakes, streams, wetlands, floodplains, and floodways to more natural conditions (e.g. restore stream channel to more natural size, pattern, and profile).
3. Enlarge or widen stream crossing structures to improve water conveyance.
4. Buffer water resources from polluted runoff.
5. Control erosive flows and flooding.
6. Use pervious or permeable surface material.
7. Install, maintain, and monitor stormwater BMPs to control runoff discharge and pollution (e.g. rain gardens, vegetated swales and filters, constructed wetlands, landscape irrigation).
8. Use context sensitive design in protecting natural resources.

Metrics & Measurements:
1. Area of wetlands restored or protected.
2. Dimensions of stream channels and floodplains (e.g. increased stream width from replacing undersized culvert).
3. Change in surface and subsurface hydrologic parameters (e.g. reduction in scouring stream velocities, increased water table elevations).
4. Change in water quality (e.g. estimated pollutant concentrations in receiving water).
5. Surface area (e.g. parking lot, roads, etc.) with treated water runoff that reduces pollution (e.g. sediment from erosion, high water temperatures, discharge of vehicle contaminants).
6. Change or addition of impervious area.

Resources:
Laws, Policies and Regulations:
Coastal Zone Management Act
http://coast.noaa.gov/czm/act/
Directors Order #77-1: Wetland Protection
http://www.nps.gov/policy/DOrders/DO77-1-Reissue.html
Clean Water Act
http://www2.epa.gov/laws-regulations/summary-clean-water-act
Executive Order 11990: Protection of Wetlands
http://environment.fhwa.dot.gov/guidebook/vol1/doc14u.pdf
Executive Order 11988: Floodplain Management
http://www.archives.gov/federal-register/codification/executive-order/11988.html

Safe Drinking Water Act
http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm

Other Guidance:
FHWA Hydraulics Engineering Publications
http://www.fhwa.dot.gov/engineering/hydraulics/library_listing.cfm
NPS Integrated Resource Management Applications Portal
https://irma.nps.gov/App/Portal
NPS Conservation and Outdoor Recreation Rivers Portal
http://www.nps.gov/ncrc/portals/rivers/index.htm
NPS Procedural Manual #77-1: Wetland Protection
http://www.nps.gov/policy/DOrders/DO77-1-Reissue.html
NPS Procedural Manual #77-2: Floodplain Management
http://www.nature.nps.gov/rm77/floodplain.cfm
NPS Water Resources
http://nature.nps.gov/water/index.cfm
US EPA. 2002. Urban Stormwater BMP Performance Monitoring
http://www.epa.gov/sites/production/files/2015-11/documents/urban-stormwater-bmps_preliminary-study_1999.pdf

USDA Water Erosion Prediction Project (NSERL Report #10, July 1995)
http://www.ars.usda.gov/Research/docs.htm?docid=18073
Forest Service WEPP
http://forest.moscowfsl.wsu.edu/fswepp/

Project Examples:

- Sequoia and Kings Canyon (SEKI) – As part of the Generals Highway rehabilitation project in Sequoia and Kings Canyon National Parks, a new bridge was constructed to replace pipe culverts where the existing roadway embankment bisected Halstead Meadow. The roadway had altered natural water flows causing major impacts to the meadow ecosystem. Most of the meadow's water was diverted into two 36-inch pipe culverts, resulting in severe incision of a channel and lowered water table for nearly the entire length of the meadow. The new bridge was designed and constructed to span the entire floodplain to facilitate natural water flows. Plus a meadow restoration plan was developed and implemented for the adjacent area. Restoration included reshaping to more natural contours, stabilizing soils, and revegetating with native plants. This road and restoration project resulted in the return of sheet flows, wetlands, and wildlife habitat to more natural conditions at Halstead Meadow.

Before bridge construction.

Landscaping in process after construction.

After bridge construction.

Another view of completed work.

Definitions of Terms and Acronyms:

<u>Water Resource Protection</u>: To design and manage transportation systems to protect or restore water quality, hydrologic processes, wetlands, and floodplains. Existing roads and trails directly affect hydrologic processes by reshaping stream channels and surrounding landscape, concentrating and redirecting water flows, and modifying watershed vegetation. Streams, rivers, lakes, wetlands, oceans, and groundwater are collecting points for runoff from transportation corridors and other developed areas in watersheds. Runoff from transportation corridors carries deleterious pollutants to receiving waters and can dramatically increase frequency and magnitude of flood flows.

NR-6: Soundscapes and Acoustic Resources

Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Protect, maintain or restore the natural and cultural soundscapes and acoustic resources.

Strategies:
1. Protect and enhance natural and cultural sounds.
2. Reduce noise by using quieter machinery, vehicles and equipment.
3. Consider timing and placement of noise generating activities in order to reduce impact on noise sensitive park resources.
4. Use quiet pavement technology as alternative to traditional pavement.
5. Use context sensitive design in protecting natural resources.
6. Identify and implement designs and construction methods that provide effective night lighting while reducing and/or eliminating light pollution.

Metrics & Measurements:
1. Systematically quantify existing, pre-project ambient sound levels, existing and natural (NSNSD has a model of the continental U.S. that can predict these levels for each park).
2. Evaluate design and proposed construction methods using the same system to reduce noise.
3. Systematically quantify impacts after construction.
4. Track number of miles of quiet pavement installed.
5. Track number of parks who have implemented "Ride Respectfully" outreach.
6. Track number of parks implementing noise reduction initiatives such as shuttle systems, purchase of quieter vehicles, or use of noise barriers.

Resources:
Laws, Policies and Regulations:
2006 NPS Management Policies (Section 4.9, and 5.3.1.7)
http://www.nps.gov/policy/mp2006.pdf
Director's Order #47: Soundscape Preservation and Noise Management
http://www.nps.gov/policy/DOrders/DOrder47.html

Other Guidance:
NPS Natural Sounds Program
http://www.nature.nps.gov/sound/index.cfm
Protecting National Park Soundscapes
http://www.nap.edu/catalog/18336/protecting-national-park-soundscapes
Zion National Park Soundscape Management Plan
http://www.nps.gov/zion/learn/management/upload/ZNP-Soundscape-Plan_Sep_2010.pdf
FHWA Highway Traffic Noise Information and Resources
http://www.fhwa.dot.gov/environment/noise/

Project Examples:
- Yellowstone (YELL) – Winter Use Plan / Snowmobile
  http://www.nps.gov/yell/learn/management/currentmgmt.htm
- Zion (ZION) – Shuttle
  http://www.nps.gov/zion/learn/nature/green-transit.htm
- Northeast Region Quiet Pavement Pilot Program

Definition of Terms and Acronyms:
Acoustic resources: Physical sound sources, including both natural sounds (wind, water, wildlife, vegetation) and cultural and historic sounds (battle reenactments, tribal ceremonies, quiet reverence).
Acoustic environment: The combination of all the acoustic resources within a given area - natural sounds and human-caused sounds – as modified by the environment.
Soundscape: The component of the acoustic environment that can be perceived and comprehended by the humans; the character and quality of the soundscape influence human perceptions of an area, providing a sense of place that differentiates it from other places.
Noise: Sound which is unwanted, either because of its effects on humans and wildlife, or its interference with the perception or detection of other sound.
Cultural soundscapes: Soundscapes with appropriate transmission of cultural and historic sounds that are fundamental components of a park's purposes and values.

NR-7: Dark Sky Preservation

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Protect, maintain or restore or the night sky or natural lightscape.

Strategies:
1. Protect and enhance night skies.
2. Minimize site lighting.
3. All exterior fixtures are full cutoff luminaries.
4. Exterior surfaces are low-reflectance.
5. Spotlights are low-angle.
6. Use less light.
7. Use context sensitive design in protecting natural resources.
8. Identify and implement designs and construction methods that provide effective night lighting while reducing amounts of light and/or eliminating light pollution.

Metrics & Measurements:
1. Systematically quantify existing, pre-project lighting and light pollution.
2. Evaluate design and proposed construction methods using the same system to reduce light pollution.
3. Systematically quantify impacts after construction.

Resources:
Laws, Policies and Regulations:
2006 NPS Management Policies (Section 4.9 and 4.10)
http://www.nps.gov/policy/mp2006.pdf

Other Guidance:
NPS Night Sky
http://www.nature.nps.gov/night/
Visibility, Environmental, and Astronomical Issues Associated with Blue-Rich White Outdoor Lighting
http://darksky.org/wp-content/uploads/bsk-pdf-manager/8_IDA-BLUE-RICH-LIGHT-WHITE-PAPER.PDF
Seeing Blue
http://darksky.org/wp-content/uploads/bsk-pdf-manager/3_SEEINGBLUE.PDF
Guides to Lighting Laws and Policy
http://darksky.org/lighting/model-lighting-laws-policy/
International Dark Sky Association Approved Light Fixtures Database Search
http://www.darksky.org/ida-fixture-seal-of-approval/search-approved-fixtures
UC Davis Guides on Innovative and Advance Lighting Efficiency
http://www.kalmiopsisaudubon.org/docs/Light_Pollution.pdfhttp://cltc.ucdavis.edu/publication-type/guides
IDA Practical Guide to Light Pollution
http://www.kalmiopsisaudubon.org/docs/Light_Pollution.pdf
Big Bend National Park: International Dark Sky Park Gold Tier Designation
http://www.nps.gov/bibe/learn/news/ida.htm

Project Examples:
- Glacier (GLAC) – National Park Walkways at Lake McDonald Lodge
- Big Bend (BIBE) – Chisos Basin Lighting Retrofits
  http://www.nationalparkstraveler.com/2010/05/its-darker-big-bend-national-park-thanks-light-reduction-project-chisos-basin5855
- University of Sherbrooke example from the Practical Guide for Lighting (page 10)
  http://www.starlight2007.net/pdf/Practical%20guide%20for%20Lighting.pdf

Definition of Terms and Acronyms:

Natural Lightscape: The resources and values that exist in the absence of human caused light at night such as nocturnal habitat or viewing a starry sky / the nighttime lightscape in the absence of human caused light.

Lightscape: Aesthetic and experiential perception of the photic environment that is integral to visitor experience and cultural resources.

Light pollution: Alteration of natural light levels in the outdoor environment by man-made sources that may degrade the utility, function, biota, or aesthetics of the surrounding environment.

Glare: Light that is brighter than the brightness to which the eye is adjusted and makes seeing difficult.

Light trespass: Light falling where it is not wanted, typically causing annoyance or disturbance.

Sky glow: Brightening of the night sky due to artificial light scattered and reflected off of air molecules and atmospheric aerosols.

Photic environment: The totality of the pattern of light at night at all wavelengths in a given area, as modified by the environment.

San Antonio Missions National Historic Park

CR-1: Historic and Prehistoric Structures

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
To protect significant historic and prehistoric structures and districts and their character defining features, and to avoid, minimize or mitigate negative impacts on these resources.

Strategies:
1. Identify all significant historic/prehistoric structures and districts in the project area: (1) check the park's Facility Condition Index (FCI) and/or List of Classified Structures (LCS); (2) are there any structures or districts eligible or listed in the National Register of Historic Places(NRHP)?; and (3) are there other structures that are managed as cultural resources by the park?
2. Maintain historic character and integrity of the structure and its setting (also see context sensitive design criteria). Treatment decisions should be consistent with the Park Roads and Parkways Handbook, the Secretary of the Interior's Standards, park management plans, and historic structure reports.
3. If museum objects are contained in a historic structure, determine if they would be substantially increased / decreased or put at risk by the proposed action. Follow park and regional collection management plans.

Metrics & Measurements:
1. Determination of Effect under Section 106 of the National Historic Preservation Act.
2. Change of condition of Asset/Structure (FCI Optimizer Band, LCS).

Resources:
Laws, Policies, and Regulations:
National Historic Preservation Act of 1966 (36 CFR 800)
http://www.achp.gov/docs/nhpa%202008-final.pdf
National Environmental Policy Act (NEPA)
http://www.epa.gov/compliance/nepa/
Director's Order 28: Cultural Resource Management
http://www.nps.gov/policy/DOrders/DOrder28.html
Historic Sites Act of 1935
http://www.cr.nps.gov/local-law/FHPL_histsites.pdf
NPS Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources
http://www.nps.gov/policy/PolMemos/PM-14-02.htm
Park Asset Management Plan Guidance/Guidebook (PAMP)
http://eppley.org/wp-content/uploads/uploads/file/62/Park_PAMP_Guide_080421.pdf

Other Guidance:
Park Roads and Parkways Program Handbook, Appendix W Landscape Lines: Historic Roads
http://www.nps.gov/features/dscw/88_PRPPHandbook/documents/Apdx-W_HistoricRoads
NPS-28: Cultural Resource Management Guidelines
http://www.nps.gov/parkhistory/online_books/nps28/28intro.htm
The Secretary of the Interior's Standards for the Treatment of Historic Properties
http://www.nps.gov/tps/standards/four-treatments/treatment-guidelines.pdf
Historic Roads in the National Park System (Special History Study)
http://www.nps.gov/parkhistory/online_books/roads/index.htm
Historic Roads
http://www.historicroads.org/

Project Examples:
- Glacier (GLAC) – The Going-to-the-Sun Road Rehabilitation project addressed deficiencies in the 50-mile deteriorating roadway while preserving its status as a National Historic Landmark and a Historic Civil Engineering Landmark. The original roadway width was maintained, and repairs were made to retaining walls, guard walls, tunnels, and other historic structures.
- Charles Young Buffalo Soldiers (CHYO) – Borders Project / Washington Monument (WASH)

Definitions of Terms and Acronyms:
Asset Priority Index (API): A facilities management tool used to identify the importance of the various infrastructure components at a park by using criteria that is weighted based on their importance to NPS core priorities. *Source: NPS State of the Parks Report;* http://www.nps.gov/stateoftheparks/cabr/parkinfrastructure/facilitycondition.cfm
Facility Condition Index (FCI): The total cost of deferred repairs that cannot be made within a year, divided by the total cost to replace the structure. The FCI gives an assigned condition category of good, fair, poor, or serious based on industry and NPS standards. *Source: NPS State of the Parks Report;* http://www.nps.gov/stateoftheparks/cabr/parkinfrastructure/facilitycondition.cfm
Historic/Prehistoric Structure: A constructed work, usually immovable by nature or design, consciously created to serve some human activity. Examples include buildings and monuments, dams, millraces and canals, stockades and fences, defensive works, temple mounds and Kivas, ruins of all structural types and outdoor sculpture. Structures that are listed or determined eligible for listing in the National Register of Historic Places are considered significant. These structures may be part of the transportation system itself, such as roads, trails, retaining walls, bridges, or culverts; or they may be located in proximity to a transportation feature.
Optimizer Band: Banding by score of assets in the Optimizer tool based on higher priority assets receiving higher priority funding, assets in the best condition receiving the top priority of funding, and minimal investments are made in assets in poor condition or of minimal importance. API/FCI is the basis for determination:
Highest = Most Important Assets: Best Condition
High = Important Assets: Best/Good Condition
Medium = Supporting Assets: Best/Good/Fair Condition

Low = Lower Priority Assets
Lowest = Minimal Investment (API<21) & Disposal
Source: NPS Facility Management Program Glossary of Terms

CR-2: Archeological Resources

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
To protect significant historic and prehistoric archeological sites, and to avoid, minimize or mitigate negative impacts on these resources.

Strategies:
Check with park resource management staff and/or regional office archeology program staff to determine if an archeological survey of the project area has been completed, and if there are previously recorded sites of historical significance.

Initiate consultation with culturally affiliated federally recognized tribes during the earliest possible stages of the planning process, as they may have concerns about the treatment of archeological sites.

If a survey is needed, it should be completed as early as possible during the planning process. Significant sites should be identified and left in site and undisturbed, or stabilized, unless removal of artifacts or intervention into cultural material is justified and documented according to federal regulations and NPS guidelines.

Also determine if artifact collections would be substantially increased. Follow park and regional curation and collection management plans.

Metrics & Measurements:
1. Determination of Effect under Section 106 of the National Historic Preservation Act.
2. Change of conditions of sites previously listed in the park's Archeological Site Management Information System (ASMIS) – Park and Region confidential database.

Resources:
Laws, Policies, and Regulations:
National Historic Preservation Act of 1966 (36 CFR 800)
http://www.achp.gov/docs/nhpa%202008-final.pdf
The Archaeological Resources Protection Act of 1979 (ARPA)
http://www.nps.gov/archeology/tools/Laws/arpa.htm
Native American Graves Protection and Repatriation Act (NAGPRA)
http://www.cr.nps.gov/local-law/FHPL_NAGPRA.pdf
Antiquities Act of 1906
http://www.nps.gov/archeology/tools/laws/antact.htm
Archeological and Historic Preservation Act (AHPA)
http://www.nps.gov/archeology/tools/Laws/ahpa.htm
National Environmental Policy Act (NEPA)
http://www.epa.gov/compliance/nepa/

Abandoned Shipwreck Act of 1987
http://www.nps.gov/history/local-law/FHPL_AbndShipwreck.pdf
Director's Order 28: Cultural Resource Management
http://www.nps.gov/policy/DOrders/DOrder28.html

Other Guidance:
NPS-28: Cultural Resource Management Guideline
http://www.nps.gov/parkhistory/online_books/nps28/28intro.htm
NPS Archeological Resources
http://www.nps.gov/archeology/

Project Examples:

- Colonial (COLO) – York River Shoreline Stabilization along the Colonial Parkway. NPS completed submerged and terrestrial archeological surveys along the road shoulder and shoreline to determine the historical significance of adjacent sites and the potential for project impacts.

Definitions of Terms and Acronyms:

Archeological Resources: The physical evidence of past human activity, including evidence of the effects of that activity on the environment. Significant archeological resources are sites that are determined eligible or are listed in the National Register of Historic Places. Types of sites are diverse, and may include remnants of roads and trails, Native American sites, Euro-American sites, military installations, resource extraction sites (quarrying, logging, mining, ranching, and farming), lighthouses, recreational sites, and shipwrecks.

The Archeological Sites Management Information System (ASMIS): The National Park Service's database for the basic registration and management of park prehistoric and historic archeological resources. *Source: NPS Midwest Archeological Center;* http://www.nps.gov/mwac/aim_pages/asmis1.htm

NAGPRA: The Native American Graves Protection and Repatriation Act, 25 USC 3001 et seq. *Source: NPS;* http://www.nps.gov/nagpra/TRAINING/GLOSSARY.HTM

CR-3: Cultural Landscapes

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
To protect significant cultural landscapes, and to avoid, minimize or mitigate negative impacts on these resources.

Strategies:
1. Consult with park resource management staff and regional cultural landscape program staff. Determine if the project area contains or is associated with a cultural landscape or landscape component listed on the park's Cultural Landscape Inventory (CLI). Identify contributing landscape features before undertaking changes in the character or use of a cultural landscape.
2. Proposed actions or treatment decisions should be evaluated for their effects on individual landscape features and on the landscape as a whole. Appropriate Cultural Landscape Reports and other treatment plans should be followed.

Metrics & Measurements:
1. Determination of Effect under Section 106 of the National Historic Preservation Act.
2. Change of condition of landscape on CLI.

Resources:
Laws, Policies, and Regulations:
National Historic Preservation Act of 1966
http://www.achp.gov/docs/nhpa%202008-final.pdf
National Environmental Policy Act
http://www.epa.gov/compliance/nepa/

Other Guidance:
NPS-28: Cultural Resource Management Guideline
http://www.nps.gov/parkhistory/online_books/nps28/28intro.htm
Park Roads and Parkways Program Handbook, Appendix W Landscape Lines: Historic Roads
http://www.nps.gov/features/dscw/88_PRPPHandbook/documents/Apdx-W_HistoricRoads.pdf
Cultural Landscapes Technical Preservation Services
http://www.nps.gov/tps/how-to-preserve/cultural-landscapes.htm
Stewardship Institute
http://www.nps.gov/csi/csihandbook/summary.htm
Historic Roads in the National Park System (Special History Study)
http://www.nps.gov/parkhistory/online_books/roads/index.htm
Historic Roads
http://www.historicroads.org/
A Guide to Cultural Landscape Reports: Contents, Process, and Techniques
http://www.nps.gov/cultural_landscapes/Documents/Guide_to_Cultural_Landscapes.pdf

Climate Change and Cultural Landscapes: Research Planning and Stewardship (2015-02)
http://ncptt.nps.gov/blog/climate-change-and-cultural-landscapes-research-planning-and-stewardship-2015-02/?utm_source=Notes+July+2015&utm_campaign=April+2015+Newsletter&utm_medium=email

Project Examples:
Fort Larned (FOLS) – Bridge Replacement

Definition of Terms and Acronyms:
Cultural Landscape: A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. Examples include farmsteads, battlefields, national cemeteries and urban streetscapes. Many historically significant roads and trails in the NPS are classified as cultural landscapes (parkways, for example) or are important components of larger cultural landscapes.
Cultural Landscape Inventory (CLI): A comprehensive inventory of all culturally and historically significant landscapes within the National Park System that records each landscape's location, historical development, existing conditions, and management information. *Source: NPS;* http://www.nps.gov/oclp/cli_main.htm
Cultural Landscape Report (CLR): A report that serves as the primary guide to treatment and use of a cultural landscape, and that prescribes the treatment and management of the physical attributes and biotic systems of a landscape, and use when use contributes to historical significance.

CR-4: Ethnographic Resources

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
To protect significant ethnographic resources, and to avoid, minimize or mitigate negative impacts on these resources.

Strategies:
1. Consult with park resource management and the regional ethnographer to determine if there are ethnographic resources in or near the project area, and/or are listed on the park's Ethnographic Resource Inventory (the database is confidential).

2. Identify particular communities, tribes, or groups, and their ways of life, known or thought to have traditional links to park natural or cultural resources. Use previously completed ethnographic studies and engage in appropriate consultation with these groups in the early planning stages to identify resources and minimize impacts.

Metrics & Measurements:
1. Determination of Effect under Section 106 of the National Historic Preservation Act.

Resources:
Laws, Policies, and Regulations:
American Indian Religious Freedom Act
http://www.cr.nps.gov/local-law/fhpl_IndianRelFreAct.pdf
Executive Order 13007: Indian Sacred Sites
http://www.nps.gov/history/local-law/eo13007.htm
Directors Order 28: Cultural Resource Management
http://www.nps.gov/policy/DOrders/DOrder28.html
National Historic Preservation Act of 1966
http://www.achp.gov/docs/nhpa%202008-final.pdf
National Environmental Policy Act
http://www.epa.gov/compliance/nepa/

Other Guidance:
NPS Cultural Resources on People
http://www.cr.nps.gov/people.htm

Project Examples:
Death Valley (DEVA) – Bonnie Claire Road

Definitions of Terms and Acronyms:
Ethnographic Resource: A site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. Do their members regard the

park's resources as essential to its development and continued existence as an ethnically or occupationally distinct people? Has the association endured for at least two generations (40 years), and did it begin prior to the establishment of the park?

Grand Teton National Park

VE-1: Safety

INSTEP Goal:
Safety – Protect public and employee health, safety, and welfare.

Criterion Intent:
Plan, design and implement park road transportation systems and infrastructure that protect the health, safety and welfare of the public and park employees without compromising the park cultural and natural resources and the visitor experience.

Strategies:
1. Balance safety standards with the context of the transportation facility (road, trail, transit stop, etc.).
2. Consider safety and engineering standards that are applicable to the roadway's context.
3. Design facilities to avoid or minimize conflicts between multiple modes.
4. Enforce laws and regulations governing circulation in parks.
5. Provide physical separation between different modes of travel.
6. Communicate safety concerns to the public through a variety of media.
7. Consider wildlife crossing to minimize wildlife and vehicle accidents.

Metrics & Measurements:
1. Collect, compare and analyze multimodal crash data (to determine safety improvements needed) for a minimum of three years, including:
   - Vehicle to vehicle crashes
   - Single vehicle crashes
   - Other alternative modes (e.g. pedestrians, equestrian, bicycles, transit, etc.)
2. Conduct an FHWA Road Safety Audit.

Resources:
Laws, Policies, and Regulations:
AASHTO: A Policy on Geometric Design of Highways and Streets (aka Green Book)
http://nacto.org/docs/usdg/geometric_design_highways_and_streets_aashto.pdf
AASHTO Guide for the Development of Bicycle Facilities 2012 (Available in the NPS DSC Library)

Other Guidance:
National Park Service Roadway Design Standards (1984 Park Road Standards)
http://www.nps.gov/policy/DOrders/parkRoadStandards.pdf
NCHRP report 500; Volume 17: A Guide for Reducing Work Zone Collisions
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v17.pdf
NCHRP Report 600 Human Factors Guidelines for Road Systems
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_600Second.pdf
Transportation Safety in the National Park Service (NPS Transportation Program Fact Sheet)
http://www.nps.gov/transportation/fact_sheet_safety.html

Intelligent Transportation Systems (NPS Transportation Program Fact Sheet)
http://www.nps.gov/transportation/factsheets/its_20090624.pdf
Primer on Highway Safety Improvement Program (HSIP)
http://ntl.bts.gov/lib/52000/52700/52751/DOT-VNTSC-NPS-14-08.pdf
FHWA Road Safety Audit
http://ntl.bts.gov/lib/52000/52700/52751/DOT-VNTSC-NPS-14-08.pdf
Flexibility in Highway Design
http://www.fhwa.dot.gov/environment/publications/flexibility/
US Access Board- ABA Standards Chapter 10: Recreational Facilities
http://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards/chapter-10-recreation-facilities

Project Examples:

- Natchez Trace (NATR) – Multi-use trail adjacent to parkway road allows pedestrians and cyclists to travel the parkway with separation from vehicular traffic
- ARC Wildlife Crossing Design Competition on Vail Pass
  https://www.youtube.com/watch?v=bCJ0qvIW5Mc&index=2&list=PL8332D998D92451DE

Definitions of Terms and Acronyms:
N/A

VE-2: Visual Resources

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and to the public to the maximum extent possible. Provide education opportunities on sustainability to the public.

Criterion Intent:
Protect the visual resources and scenic values of the park which contribute to the overall visitor experience and satisfaction.

Strategies:
1. Protect, enhance or create visual resources.
2. Consider how construction impacts visual resources.
3. Protect the visual resources of the transportation facility.
4. Consider views and viewsheds during the various seasons and times of day/night.
5. Provide opportunities through scenic overlooks and viewpoints for visitors to enjoy the visual resources.

Metrics & Measurements:
1. Inventory and analyze the existing visual resources that contribute to the establishment of the park unit.
2. Determine the positive or negative impacts to visual resources.
3. Identify the heavily used viewpoints and conduct a user count.

Resources:
Laws, Policies, and Regulations:
Clean Air Act
http://www.epa.gov/air/caa/
National Historic Preservation Act
http://www.achp.gov/docs/nhpa%202008-final.pdf

Other Guidance:
National Park Service Roadway Design Standards (1984 Park Road Standards)
http://www.nps.gov/policy/DOrders/parkRoadStandards.pdf
Interagency Visitor Use Management Council (Replaces Visitor Experience and Resource Protection Handbook)
http://planning.nps.gov/document/verphandbook.pdf
National Scenic Byways Program (NPS Transportation Program Fact Sheet)
http://www.nps.gov/transportation/factsheets/natl_scenic_byways_20090624.pdf
National Park Service Night Skies
http://www.nature.nps.gov/night/index.cfm
BLM Visual Resource Management
http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS.html
BLM Handbook (SectionH-8410) Resource Inventory
http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par
.31679.File.dat/H-8410.pdf

BLM Handbook Section H-8431 Visual Resource Contrast Rating
http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par
.79462.File.dat/8431.pdf
US Forest Service Scenery Management System
http://www.fs.usda.gov/detail/tonto/landmanagement/planning/?cid=stelprdb5412120Applicable local
zoning ordinances
Applicable Local Zoning Ordinances
https://www.municode.com/library/
FHWA Visual Impact Assessment for Highway Projects
http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf

Project Examples:

- Glacier (GLAC) – Going-to-the-sun Road Vista Management Plan
- Mississippi (MISS) – Visual Resources Protection Plan for National River and Recreation Area
- Natchez Trace (NATR) – BLM Battle Mountain Parkway project
- Blue Ridge Parkway (BLRI)

Definitions of Terms and Acronyms:

Visual Resources: Views of lands near the parks, monuments, and properties that are an important part of the visitor's experience. These lands may either form the "visual backdrop" for views of important landscape features, or they may be of sufficient scenic quality on their own to become an important part of visitors' scenic experiences. *Source: Argone National Laboratory;* http://visualimpact.anl.gov/evpp/

Viewpoint: A place affording a view of something; position of observation. *Source:* http://dictionary.reference.com/browse/viewpoint

Viewshed: The surface area visible from a given viewpoint or series of viewpoints; it is also the area from which that viewpoint may be seen. *Source: FHWA;* http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf

Overlook: To rise above or afford a view of. *Source:* http://www.merriam-webster.com/dictionary/overlook

VE-3: Connectivity

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and to the public to the maximum extent possible. Provide education opportunities on sustainability to the public.

Criterion Intent:
Provide connections and options to desired origins, destinations, and opportunities within the park and surrounding communities.

Strategies:
1. Provide connections within the park and to surrounding communities.
2. Consider multimodal connections where feasible. (Provide and protect subsistence access).
3. Consider concepts and principles of livability.
4. Develop partnerships with local communities, other government agencies and organizations in sharing transportation resources.
5. Provide signage to direct the public to desired destinations.
6. Provide more transportation options to access the park, thus creating additional visitor experiences.
7. Reduce traffic congestion.

Metrics & Measurements:
1. Determine success of connections and access to destinations through surveys and/or other applicable methods.
2. Track mode share.
3. Quantify change in traffic congestion through Level of Service analysis.

Resources:
Laws, Policies, and Regulations:
Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance
http://www.gpo.gov/fdsys/pkg/FR-2009-10-08/pdf/E9-24518.pdf

Other Guidance:
FHWA Computation of Level of Service
http://ops.fhwa.dot.gov/publications/fhwahop08054/sect4.htm
NPS Toolkit (Link for NPS Staff)
http://inside.nps.gov/centennial/
NPS Toolkit (External Link)
http://nextcenturyforparks.org/
National Park Usage and Travel Modes (NPS Transportation Program Fact Sheet)
http://www.nps.gov/transportation/national_parks_usage_and_travel_modes.html
Bicycle and Pedestrian Trails (NPS Transportation Program Fact Sheet)
http://www.nps.gov/transportation/fact_sheet_Bicycle_Pedestrian_Trails.html

Alternative Transportation Systems Partnerships (NPS Transportation Program Fact Sheet)
http://www.nps.gov/transportation/fact_sheet_alternative_transportation_systems_partnerships.html
USDOT, Federal Transit Administration Liveable and Sustainable Communities
http://www.fta.dot.gov/about/13747.html
USDOT, Federal Highway Administration, Livability in Transportation Guidebook
https://www.fhwa.dot.gov/livability/case_studies/guidebook/livabilitygb10.pdf
Separated Bike Lane Planning and Design Guide
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/page00.cfm

Project Examples:
- Zion (ZION), Rocky Mountain (ROMO), etc. – Shuttle bus system from a gateway community
- Fort Sumter (FOSU) – Ferry system / tour boat
- Grand Teton (GRTE) – Multi-use Path
- Natchez Trace (NATR) – Parkway
- Boston (BOST) – Freedom Trail
- Pensacola Bay (no abbreviation) – Ferry and Shuttle Transportation Plan
- Bryce Canyon (BRCA) – Multi-use visitor path

Definitions of Terms and Acronyms:
Level of Service (LOS): A qualitative assessment of a road's operating conditions. For local government comprehensive planning purposes, level of service means an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service indicates the capacity per unit of demand for each public facility. This term refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F. *Source: FHWA;*
http://www.fhwa.dot.gov/planning/glossary/glossary_listing.cfm?sort=definition&TitleStart=L
Multimodal: Facilities serving more than on transportation mode or a transportation network comprised of a variety of modes.
Subsistence access: To reach a destination using minimal or native means of transportation.
Mode share: Indicates the share of the region's travel that is made by different modes of Transportation. Major Transportation modes include driving alone (single-occupancy vehicles) carpooling (high-occupancy vehicles), transit, and walking/biking. *Source: Chicago Metropolitan Agency for Planning (CMAP);*
http://www.cmap.illinois.gov/about/2040/supporting-materials/process-archive/scenario-evaluation/scenario-outcomes/mode-share

VE-4: Accessibility

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and to the public to the maximum extent possible. Provide education opportunities on sustainability to the public.

Criterion Intent:
Provide access for all users where practicable.

Strategies:
1. Provide access to all users, consistent with applicable federal and local accessibility laws and regulations; including outdoor recreation facilities.
2. Provide signage which complies with accessibility requirements, guidelines and standards.
3. Consider the principles of universal design.
4. Conduct accessibility assessment and develop transition plan.
5. Provide informational accessibility to all users.

Metrics & Measurements:
1. Document new accessible facilities created and existing facilities retrofitted for accessibility.
2. Document progress towards goals of transition plan.

Resources:
Laws, Policies, and Regulations:
Directors Orders 42: Accessibility for Visitors with Disabilities in National Park Service Programs and Services
http://www.nps.gov/policy/DOrders/DOrder42.html
Americans with Disability Act (ADA)
http://www.ada.gov/
Architectural Barriers Act (ABA)
http://www.access-board.gov/the-board/laws/architectural-barriers-act-aba
Proposed Accessibility Guidelines for the Pedestrian Facilities in the Public Right-of-Way (PROWAG)
http://www.access-board.gov/attachments/article/743/nprm.pdf
Architectural Barriers Act Accessibility Standard
http://www.gsa.gov/portal/category/21630

Other Guidance:
US Access Board Requirements for Recreation Facilities in the ADA and ABA Standards
http://www.access-board.gov/guidelines-and-standards/recreation-facilities/about-recreation-facilities
NPS Denver Service Center Workflows, Accessibility Standards
http://www.nps.gov/dscw/ds-accessibility.htm
All In! – Accessibility in the National Park Service, 2015-2020

FHWA Statewide Pedestrian and Bicycle Planning Handbook
http://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/pedestrian_bicycle_handbook/fhwahep14051.pdf

Project Examples:
- Fort Sumter (FOSU) – Tour boat facility design of ramp to board tour boat
- Zion (ZION) – Wheel chair user boarding shuttle bus
- Natchez Trace (NATR) – Parkway multi-use trail adjacent to parkway road allows pedestrians and cyclists to travel the parkway with separation from vehicular traffic - Trail and facilities are compliant with ABAAS standards

Definitions of Terms and Acronyms:
Accessibility: To the highest degree practicable, people with disabilities are able to participate in the same programs and activities available to everyone else. Seek to achieve the highest level of accessibility that is reasonable, while ensuring consistency with the other legal mandates of conservation and protection of the resources we manage.
Americans with Disability Act (ADA): The ADA prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.
Architectural Barriers Act Accessibility Standards (ABAAS): Standards to ensure accessibility for all facilities covered by ABA that went effective May 8, 2006. The ABAAS replaced both UFAS (Uniform Federal Accessibility Standards) and ADAAG (ADA Accessibility Guidelines) for all federally funded projects.
Universal Design Principles: The design of products, communications, and environments to be simple and usable by people of all ages, sizes and abilities (including disabilities) without the need for special adaptations or specialized design. There are 7 principles:
1. Equitable use for any group of people
2. Flexibility - choice; adaptability to user's needs and abilities
3. Simple and intuitive to use in spite of users experience level, language skills, knowledge or concentration level
4. Perceptible information is provided regardless of user's sensory abilities or ambient conditions
5. Tolerance for error - minimal hazards and adverse consequences or accidental/unintended consequences
6. Low physical efforts required - efficient and comfortable
7. Adequate size and space for approach regardless of user's body size, posture or mobility

Accessibility Assessment: Methodologically analyzing the means to reach certain destinations through various modes
Transition Plan: Documents the steps necessary to turn the project's product or service over to the business unit and maintenance & operations support staff. The plan assures that all of the necessary steps are identified and that each of these steps has resources assigned to them. *Source: Washington State Office of the Chief Information Officer;* https://ocio.wa.gov/pmframework/initiation/planning/implementation

VE-5: Education and Outreach

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and to the public to the maximum extent possible. Provide education opportunities on sustainability to the public.

Criterion Intent:
Develop and enhance opportunities for public education and outreach.

Strategies:
1. Provide visitors with information concerning park transportation facilities, conditions, and options.
2. Share NPS sustainability practices through exhibits and other media.

Metrics & Measurements:
1. Determine success of interpretive and outreach programs through surveys and/or other applicable methods.
2. Evaluate visitor participation in the programs.

Resources:
Laws, Policies, and Regulations:
NPS Directors Order 6: Interpretation and Education
http://www.nps.gov/policy/DOrders/Dorder6.html

Other Guidance:
NPS Management Policies (Section 7)
http://www.nps.gov/policy/mp2006.pdf

Project Examples:
- Denali (DENA) – Eilson Visitor Center interpretation
- Grand Canyon (GRCA) – Canyon View Information Plaza interpretation
- Zion (ZION) – Interpretation

Definitions of Terms and Acronyms:
N/A

VE-6: Local Economy

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and to the public to the maximum extent possible.

Criterion Intent:
Consider impacts to the local and regional economy.

Strategies:
1. Create opportunities for benefits to the local economy and avoid new negative impacts to the local economy by providing opportunities for concession operations and maintaining connections.

Metrics & Measurements:
1. Number of new business opportunities in the local community
2. Change in the local economic tax base
3. Ensure consultation/coordination with the park and stakeholders

Resources:
Laws, Policies, and Regulations:
N/A

Other Guidance:
HUD-DOT EPA Partnership for Sustainable Communities
https://www.sustainablecommunities.gov/

Project Examples:
- Mississippi (MISS) – National River and Recreation Area Alternative Transportation Plan
  http://www.nps.gov/miss/parkmgmt/atp.htm
- Great Smoky Mountains (GRSM) – Newfound Gap Road Tunnel Expansion

Definitions of Terms and Acronyms:
N/A

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San Antonio Missions National Historic Park

EC-1: Air Quality

INSTEP Goals:
Resource Protection – Protect, enhance, and restore cultural and natural resources.
Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Protect, maintain or enhance air quality.

Strategies:
1. Reduce greenhouse gas (GHG) emissions. (Reduce vehicle miles traveled, reduce congestion and encourage alternative modes of transportation).
2. Use remote measurement (e.g. air quality monitoring) as an opportunity for innovation.
3. Implement a traffic control plan that minimizes idling and congestion (e.g. alternate routes around construction closures).
4. Reduce emissions from construction equipment.
5. Use Climate Leadership in Parks (CLIP) Tool as applicable.
6. Require dust control during construction.

Metrics & Measurements:
1. As applicable, use one or more of the following:
   - CLIP Tool results
   - Reduction of miles travelled
   - Idling reduction
   - Dust control
   - How a project reduced GHG production (e.g. encouraging non-motorized or alternative travel)
   - Number of vehicle trips mitigated based on alternative transportation system usage and typical number of passengers per vehicle

Resources:
Laws, Policies and Regulations:
2006 NPS Management Policies (Section 4.7.1)
http://www.nps.gov/policy/mp2006.pdf
Clean Air Act
http://www.epa.gov/air/caa/index.html

Other Guidance:
A Performance-Based Approach to Addressing Greenhouse Gas Emissions through Transportation Planning
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_750v2.pdf
NPS Congestion Management Toolkit
http://www.nps.gov/transportation/pdfs/NPS-CMS_Toolkit.pdf
National Climate Assessment
http://nca2014.globalchange.gov/

NPS Green Parks Plan
http://www.nps.gov/greenparksplan/
CLIP Tool
http://www.nps.gov/climatefriendlyparks/CLIPtool/
USFWS Roadway Design Guidelines, 2012, LE-5 Address Climate Change
http://www.transwildalliance.org/resources/20114211913.Pacific.Region.Roadway.Design.Guidelines.pdf
Carbon Storage in U.S. Easter Ecosystems Helps Counter Greenhouse Gas Emissions Contributing to Climate Change
http://www.usgs.gov/newsroom/article.asp?ID=3926#.U_SPFPldWBI
NPS Policy Memorandum 12-02: Applying National Park Service Management Policies in the Context of Climate Change
http://www.nps.gov/policy/MPandCC.pdf
U.S. Global Change Research Program
http://www.globalchange.gov/
NPS Climate Change
http://www.nps.gov/subjects/climatechange/index.htm
FHWA Climate Change Adaptation Case Studies
http://www.fhwa.dot.gov/environment/climate_change/adaptation/case_studies/

Project Examples:

- Zion (ZION) – Alternative Transportation System. In 1997, visitation was 2.4 million and increasing. The shuttle system was established to eliminate traffic and parking problems, protect vegetation, and restore tranquility to Zion Canyon.

  Annual number of persons who use the alternative transportation system (ridership/usage); 3,141,946 (in the park only) or 3,650,812 (in the park and Springdale) in CY 2013. Also, these numbers are boardings; the number of people is approximately half or less of that number, but it is not tracked directly.

  Estimated number of vehicle trips mitigated based on alternative transportation system usage and the typical number of passengers per vehicle: About 3,000 to 4,000 cars per day enter Zion through the East and South entrances. Statistics show that those cars carry 2.2 to 2.8 passengers per vehicle (varies by month and entrance station). It is unknown how many of those visitors use the shuttle system, but it's probably a fairly high percentage. Our service provider estimated in 2006 that the shuttle system reduced private vehicle use by 50,385 miles each day, resulting in 10,580,866 miles over the whole season. This prevented 5,082,254 pounds of carbon dioxide from being released into the atmosphere. In CY 2013, the average number of riders per hour (park and Sprindgale) was 76.56; the average number of riders per hour (park only) was 81.29.

Definitions of Terms and Acronyms:

CLIP Tool: The Climate Leadership in Parks (CLIP) Tool is an excel-based tool that aids parks in conducting greenhouse gas (GHG) emissions inventories. The two-module tool also aids in the development of strategies for reducing emissions. *Source: NPS Climate Friendly Parks;* http://www.nps.gov/climatefriendlyparks/CLIPtool/

<u>Greenhouse Gas (GHG)</u>: Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. *Source: Intergovernmental Panel on Climate Change;* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_appendix.pdf

EC-2: Recycling

INSTEP Goals:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Recycle, reuse, and compost where possible.

Strategies:
1. Conserve and recycle water.
2. Recycle waste material when practicable.
3. Reuse building materials (e.g. asphalt, wood, stone, concrete, etc.) when practicable.
4. Compost materials.
5. Use bio-preferred products when possible.
6. Provide incentives to contractors to recycle, reuse, and compost materials.

Metrics & Measurements:
1. Document types and quantities of materials recycled, reused and composted.
2. Document types and quantities of bio-preferred products used.

Resources:
Laws, Policies, and Regulations:
Green Parks Plan - Buy Green and Reduce, Reuse, and Recycle
http://www.nps.gov/greenparksplan/downloads/NPS_2012_Green_Parks_Plan.pdf

Other Guidance:
FHWA Recycling Policy
http://www.fhwa.dot.gov/pavement/recycling/
Measuring Recycling: A Guide for State and Local Governments
http://infohouse.p2ric.org/ref/01/00801/00801.pdf
BioPreferred Program
http://www.biopreferred.gov/
USFWS Roadway Design Guidelines, 2012, DE-6 Consider Range and Sources of Materials for Sustainable Construction
http://www.transwildalliance.org/resources/20114211913.Pacific.Region.Roadway.Design.Guidelines.pdf

Project Examples:
- Death Valley (DEVA) – Road Rehabilitation
- Any examples of full depth reclamation of asphalt roadway

Definitions of Terms and Acronyms:
Bio-Based/Preferred Products: Commercial or industrial goods (other than food or feed) determined by the U.S. Department of Agriculture (USDA) Secretary to be composed in whole or in significant part of biological products, forestry materials, or renewable domestic agricultural materials, including plant, animal, or marine materials. *Source: General Services Administration (GSA);* http://www.gsa.gov/portal/category/27117#

EC-3: Heat Island

INSTEP Goals:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Reduce or prevent the heat island effect.

Strategies:
1. Select materials and design facilities to reduce or prevent overall heat island effect.
2. Plant trees and vegetation to shade the built environment.
3. Minimize areas of pavement.
4. Use light colored pavement where practicable.

Metrics & Measurements:
1. Area of pavement and/or built environment shaded.
2. Area of pavement eliminated or avoided.
3. Area of light colored pavement used.

Resources:
Laws, Policies and Regulations:
N/A

Other Guidance:
Reducing Urban Heat Islands: Compendium of Strategies
http://www.epa.gov/heatislands/resources/pdf/GreenRoofsCompendium.pdf

Project Examples:
- Zion (ZION) – Visitor Center Parking and Plaza. Parking and pedestrian areas are well-shaded with native vegetation.
- Great Smoky Mountains (GRSM) – Oconaluftee Visitor Center. Light-colored pavement was used in parking lot.

Definitions of Terms and Acronyms:
Heat Island Effect: Describes built up areas that are hotter than nearby rural areas.
Source: Environmental Protection Agency; http://www.epa.gov/heatisland/

EC-4: Energy Consumption

INSTEP Goals:
Resource Protection – Protect, enhance, and restore cultural and natural resources.
Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Minimize energy use.

Strategies:
1. Use best management practices (BMPs) to minimize energy use.
2. During construction, and operations and maintenance (O&M), use renewable resources.
3. Provide incentives to contractors to minimize energy use.
4. Use Climate Leadership in Parks (CLIP) Tool.
5. Design facilities that minimize energy use through life-cycle (e.g. alternative transportation, human-powered transportation).

Metrics & Measurements
1. Quantify use of renewable resources.
2. Quantify energy saved during construction and O&M.
3. CLIP Tool results.

Resources:
Laws, Policies and Regulations:
Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance
https://www.fedcenter.gov/programs/eo13514/

Other Guidance:
Policy Options for Reducing Energy Use and Greenhouse Gas Emissions from U.S. Transportation
http://onlinepubs.trb.org/onlinepubs/sr/sr307.pdf
CLIP Tool
http://www.nps.gov/climatefriendlyparks/CLIPtool/
National Long Range Transportation Plan (NLRTP) Performance Measure: Percentage decrease in NPS transportation system emissions (Page 10).
U.S. Global Change Research Program
http://www.globalchange.gov/
NPS Climate Change
http://www.nps.gov/subjects/climatechange/index.htm
FHWA Climate Change Adaptation Case Studies
http://www.fhwa.dot.gov/environment/climate_change/adaptation/case_studies/

Project Examples:
N/A
Definitions of Terms and Acronyms:

<u>Natural Resources</u>: Materials or substances such as minerals, forests, water, and fertile land that occur in nature and can be used for economic gain.

<u>Cultural Resources</u>: An aspect of a cultural system that is valued by or significantly representative of a culture or that contains significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as districts, sites, buildings, structures, and objects for the National Register of Historic Places and as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources for NPS management purposes.

<u>Renewable Resources</u>: A natural resource that renews itself at a rate that is faster, or equal to the rate of consumption. Renewable resources differ from resources that once depleted never return, such as fossil fuels. Renewable resources can include perpetually sustainable resources that never run out, such as solar power, as well as renewable commodities like paper. The use and cultivation of renewable resources helps to minimize the impact humanity has on the Earth, while ensuring continued survival. *Source: Greenliving;* http://greenliving.lovetoknow.com/Examples_of_Renewable_Resources

<u>Best Management Practices (BMPs)</u>: Practices that apply the most current means and technologies available to not only comply with mandatory environmental regulations, but also maintain a superior level of environmental performance.

Great Smoky Mountains National Park

MC-1: Material Selection

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources. Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Use materials that are low-impact and context appropriate.

Strategies:
1. Use low-emitting materials (including VOCs).
2. Use recycled/re-used materials in construction.
3. Consider long-life pavement and other materials.
4. Consider warm-mix asphalt.
5. For pavement sealants, consider emulsified delivery over hot-applied delivery.
6. Use bio-preferred and renewable materials.

Metrics & Measurements:
1. Document the number or percent of low-emitting materials (e.g. surface treatments, emulsified pavement sealants).
2. Document the total and percent tons of asphalt placed on the project that is warm-mix asphalt.
3. Document the total and percent tons of bio-preferred and renewable materials used.

Resources:
Laws, Policies and Regulations:
N/A

Other Guidance:
Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes (page 8, V)
http://www.whitehouse.gov/sites/default/files/microsites/ceq/recommendations_on_sustainable_landscaping_practices.pdf
US Green Building Council, LEED Documentation: "Low Emitting Materials. *For exterior applied products:* Adhesives, sealants, coatings, roofing, and waterproofing materials applied on site must meet the VOC limits of California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings, and South Coast Air Quality Management District (SCAQMD), Rule 1168, effective July 1, 2005."
Warm-Mix Asphalt
http://www.fhwa.dot.gov/pavement/asphalt/wma.cfm
Bio-preferred Materials
www.biopreferred.gov/
USFWS Roadway Design Guidelines
http://www.transwildalliance.org/resources/20114211913.Pacific.Region.Roadway.Design.Guidelines.pdf

Project Examples:

Yellowstone (YELL) – Placement of Warm-Mix Asphalt on the East Entrance Road
http://permanent.access.gpo.gov/lps119091/wma-booklet.pdf

Definitions of Terms and Acronyms:

Low-Emitting Materials: Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants. *Source: U.S. Green Building Council;* http://www.usgbc.org/credits/schools-new-construction-healthcare/v4-draft/eqc2

VOCs: Volatile organic chemical compounds (any of a large class of chemical compounds whose molecules contain carbon) are everywhere in both indoor and outdoor environments because they have become essential ingredients in many products and materials. Outdoors, VOCs are volatized or released into the air mostly during manufacture or use of everyday products and materials, while indoors VOCs are mostly released into the air from the use of products and materials containing VOCs. VOCs are of concern as both indoor air pollutants and as outdoor air pollutants. However, the emphasis of that concern outdoors is different from indoors. The main concern indoors is the potential for VOCs to adversely impact the health of people that are exposed. While VOCs can also be a health concern outdoors, EPA regulates VOCs outdoors mainly because of their ability to create photochemical smog under certain conditions. Although the same term "VOC" is used for both indoor and outdoor air quality, the term is defined differently to reflect its predominant concern in each context. This has created a misunderstanding in the marketplace and in the environmental community. In addition, the measured quantity and composition of VOCs in the air can vary significantly depending on the measurement methods used, which has generated additional confusion.

Source: Environmental Protection Agency (EPA) http://www.epa.gov/iaq/voc2.html

Warm-Mix Asphalt: The generic name of technologies that allow the producers of hot-mix asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road.

Source: National Asphalt Pavement Association;
http://www.asphaltpavement.org/index.php?option=com_content&view=article&id=148&Itemid=329

MC-2: Waste Management

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources.
Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Minimize waste stream and strive for zero net waste.

Strategies:
1. Maximize recycling and re-use of materials (e.g. asphalt, metal, wood and concrete).
2. Require contractors to develop and implement waste management plan.
3. Handle imported or project generated materials responsibly.
4. Ensure proper disposal and recycling of non-construction waste (recycling / anti-litter program).

Metrics & Measurements:
1. Document reuse or recycling of onsite materials.
2. Document percent of total waste diverted from landfills.
3. Determine how well project performed relative to targets in waste management plan.
4. Document maintenance of clean worksite.

Resources:
Laws, Policies and Regulations:
N/A

Other Guidance:
EPA Waste Management Guidance
http://www.epa.gov/climatechange/wycd/waste/downloads/execsum.pdf
Best Practice Guidelines on the Preparation of Waste Management Plans for Construction
http://www.environ.ie/en/Publications/Environment/Waste/WasteManagement/FileDownLoad,1481,en.pdf
NPS Workflows – Waste Management Plan
NPS - Please provide a web address for this resource

Project Examples:
- Fort Sumter (FOSU) – Ferry Boat Visitor Education Facility
- Any examples of a rehabilitated hazmat site

Definitions of Terms and Acronyms:
Zero Net Waste: Maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace. *Source: GrassRoots Recycling Network;* http://www.grrn.org/page/what-zero-waste
Waste Management Plan: A plan that predicts the quantities and types of waste that will be generated during a construction, renovation or demolition project, identifies the final destination of that waste, and estimates costs. *Source: Environmental Protection Agency (EPA);* http://www.epa.gov/region9/waste/solid/pdf/cd5.pdf

<u>Non-Construction Waste</u>: Debris not created during any construction, renovation or demolition project, such as visitor garbage.

MC-3: Construction Practices

INSTEP Goal:
Resource Protection – Protect, enhance, and restore cultural and natural resources.
Conserve natural resources to the maximum extent practicable.

Criterion Intent:
Implement sustainable construction practices.

Strategies:
1. Consider appropriate timing, construction methods, and equipment to minimize adverse impacts.
2. Use bio-preferred products.
3. Use energy efficient construction equipment.
4. Avoid soil compaction in areas to be re-vegetated or where vegetation is to be maintained, or other sensitive areas.
5. Minimize and reduce water use during construction.

Metrics & Measurements:
1. Document use of appropriate timing, construction methods, and equipment to minimize adverse impacts.
2. Document use of biopreferred products.
3. Document use of energy efficient construction equipment.
4. Document avoidance of soil compaction in areas to be revegetated or where vegetation is to be maintained, or other sensitive areas.
5. Document water use during construction.

Resources:
Laws, Policies and Regulations:
N/A

Other Guidance:
Arizona State Sustainable Highway Construction Practices
http://pavement.engineering.asu.edu/wordpress/wp-content/uploads/2013/12/Sustainable-Highway-Construction-Practices-Underwood-and-El-Asmar.pdf
BMPs for Sustainable Design and Construction
http://www.ctiponline.org/publications/view_file.ashx?fileID=145
BMP for Chemical Treatment Systems for Construction Storm Water and Dewatering
http://www.ctiponline.org/publications/view_publication.aspx?id=51
NPS Version Construction Specifications Institute (CSI) Division 1 Specification: Waste Management 017419

Project Examples:
- Yellowstone (YELL) Green Roads Case Study / Madison – Norris

Definitions of Terms and Acronyms: N/A

MC-4: Quality Control

INSTEP Goal:
Facility Management – Improve operational efficiency and reliability. Provide educational opportunities on sustainability to employees. Incorporate methods and materials that ensure system longevity.

Criterion Intent:
Ensure sustainable practices through the construction process.

Strategies:
1. Contract documents should ensure sustainable practices by including: training for contractors in general environmentally sustainable practices and park-specific and/or project environmental practices.
2. Prepare a quality control plan to ensure implementation of sustainability requirements.
3. Carry out remedial and corrective actions when objectives are not met.

Metrics & Measurements:
1. Document training for contractor's in general environmentally sustainable practices and park-specific and/or project environmental practices.
2. Document implementation of quality control plan.
3. Document any remedial or corrective actions.

Resources:
Laws, Policies and Regulations:
N/A

Other Guidance:
NPS Quality Assurance Guidelines
http://www.nps.gov/dscw/qaguideline.htm
An Integrated Approach for Building Sustainable Roads
http://www.ctiponline.org/publications/view_publication.aspx?id=107

Project Examples:
N/A

Definitions of Terms and Acronyms:
N/A

MC-5: Noise and Vibration

INSTEP Goal:
Visitor Experience – Provide for visitor enjoyment and access. Provide equitable benefits and access to employees and the public to the maximum extent possible. Provide educational opportunities on sustainability to the public.

Criterion Intent:
Minimize construction related noise and vibration impacts to people and natural and cultural resources.

Strategies:
1. Minimize noise and vibration during construction.
2. Consider quiet technologies (e.g. pavement materials).
3. Use equipment with proper noise suppression components (e.g. mufflers).
4. Mitigate impacts of site blasting on people and natural and cultural resources.

Metrics & Measurements:
1. Document minimization of noise and vibration during construction.
2. Document use of quiet technologies (e.g. pavement materials).
3. Document use proper noise suppression components on equipment (e.g. mufflers).
4. Document mitigation of impacts of site blasting on people and natural and cultural resources.

Resources:
Laws, Policies, and Regulations:
2006 NPS Management Policies (Section 4.9)
http://www.nps.gov/grca/naturescience/upload/MP2006_Soundscape.pdf

Other Guidance:
FHWA Construction Noise Handbook
http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm

Project Examples:
- Golden Gate (GOGA) – F-line extension

Definitions of Terms and Acronyms:
Quiet Pavement Materials: Innovations in asphalt surface mixes have helped reduce the noise level of asphalt, making it the "quiet pavement." Quiet asphalt mixes can reduce the need for costly sound barriers. These quiet pavement technologies include open-graded surfaces, fine-graded surfaces, rubberized asphalt, and stone-matrix asphalt, which have led to noise reductions as great as 7 decibels. Reducing noise by 3 decibels is equivalent to doubling the distance from the road to the listener. And since asphalt roads tend to be quieter than other paving materials, they ultimately can lead to less driver fatigue, underlining the pavement's superior safety capabilities as well.
Source: American Asphalt Alliance: http://driveasphalt.org/

<u>Quiet Technologies</u>: The application of engineering and/or applied sciences to find practical solutions to manage and reduce roadway noise and tire-pavement noise.

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Arches National Park

GLOSSARY

Definition of Acronyms and Terms

Note: * indicates definitions also available on the DSC Design and Construction Workflow Process Definitions here: http://www.nps.gov/dscw/definitions.htm

Asset Priority Index (API)
A facilities management tool used to identify the importance of the various infrastructure components at a park by using criteria that is weighted based on their importance to NPS core priorities. *Source: NPS State of the Parks Report;* http://www.nps.gov/stateoftheparks/cabr/parkinfrastructure/facilitycondition.cfm

Accessibility
To the highest degree practicable, people with disabilities are able to participate in the same programs and activities available to everyone else. Seek to achieve the highest level of accessibility that is reasonable, while ensuring consistency with the other legal mandates of conservation and protection of the resources we manage.

Accessibility Assessment
Methodologically analyzing the means to reach certain destinations through various modes

Acoustic Environment
The combination of all the acoustic resources within a given area - natural sounds and human-caused sounds – as modified by the environment

Acoustic Resources
Physical sound sources, including both natural sounds (wind, water, wildlife, vegetation) and cultural and historic sounds (battle reenactments, tribal ceremonies, quiet reverence).

Americans with Disability Act (ADA)*
The ADA prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.

Archeological Resources
The physical evidence of past human activity, including evidence of the effects of that activity on the environment. Significant archeological resources are sites that are determined eligible or are listed in the National Register of Historic Places. Types of sites are diverse, and may include remnants of roads and trails, Native American sites, Euro-American sites, military installations, resource extraction sites (quarrying, logging, mining, ranching, and farming), lighthouses, recreational sites, and shipwrecks.

Archeological Sites Management Information System (ASMIS)
ASMIS is the National Park Service's database for the basic registration and management of park prehistoric and historic archeological resources. *Source: NPS Midwest Archeological Center;* http://www.nps.gov/mwac/aim_pages/asmis1.htm

Architectural Barriers Act Accessibility Standards (ABAAS)*
Standards to ensure accessibility for all facilities covered by ABA that went effective May 8, 2006. The ABAAS replaced both UFAS (Uniform Federal Accessibility Standards) and ADAAG (ADA Accessibility Guidelines) for all federally funded projects.

Best Management Practices (BMPs)*
Practices that apply the most current means and technologies available to not only comply with mandatory environmental regulations, but also maintain a superior level of environmental performance.

Bio-Based/Preferred Products
Commercial or industrial goods (other than food or feed) determined by the U.S. Department of Agriculture (USDA) Secretary to be composed in whole or in significant part of biological products, forestry materials, or renewable domestic agricultural materials, including plant, animal, or marine materials. *Source: General Services Administration (GSA);* http://www.gsa.gov/portal/category/27117#

CLIP Tool
The Climate Leadership in Parks (CLIP) Tool is an excel-based tool that aids parks in conducting greenhouse gas (GHG) emissions inventories. The two-module tool also aids in the development of strategies for reducing emissions. *Source: NPS Climate Friendly Parks;* http://www.nps.gov/climatefriendlyparks/CLIPtool/

Context Sensitive Design
Incorporating natural and cultural resource considerations into all aspects of transportation decision-making to avoid, minimize or mitigate negative resource impacts.

Context Sensitive Solutions (CSS)
"Context sensitive solutions (CSS) is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist." - Federal Highway Administration (FHWA)

Cultural Landscape*
A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. Examples include farmsteads, battlefields, national cemeteries and urban streetscapes. Many historically significant roads and trails in the NPS are classified as cultural landscapes (parkways, for example) or are important components of larger cultural landscapes.

Cultural Landscape Inventory (CLI)*
A computerized, evaluated inventory of all cultural landscapes for which the National Park Service has or plans to acquire any legal interest. The CLI includes a description of the location, historical development, landscape characteristics and associated features, and management of cultural landscapes in the national park system.

Cultural Landscape Report (CLR)*
A report that serves as the primary guide to treatment and use of a cultural landscape, and that prescribes the treatment and management of the physical attributes and biotic systems of a landscape, and use when use contributes to historical significance.

Cultural Resources*
An aspect of a cultural system that is valued by or significantly representative of a culture or that contains significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as districts, sites, buildings, structures, and objects for the National Register of Historic Places and as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources for NPS management purposes.

Cultural Soundscapes
Soundscapes with appropriate transmission of cultural and historic sounds that are fundamental components of the a park's purposes and values

Emergency Relief for Federally Owned Roads (ERFO)
ERFO was established to provide funding and engineering services to help Federal land management agencies that have received serious damage due to natural or manmade disasters or a catastrophic failure. ERFO funds are meant to restore the transportation system back to pre-disaster conditions. *Source: NPS;* http://www.nps.gov/transportation/fact_sheet_emergency_relief.html

Ethnographic Resource*
A site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. Do their members regard the park's resources as essential to its development and continued existence as an ethnically or occupationally distinct people? Has the association endured for at least two generations (40 years), and did it begin prior to the establishment of the park?

Facility Condition Index (FCI)
The total cost of deferred repairs that cannot be made within a year, divided by the total cost to replace the structure. The FCI gives an assigned condition category of good, fair, poor, or serious based on industry and NPS standards. *Source: NPS State of the Parks Report;* http://www.nps.gov/stateoftheparks/cabr/parkinfrastructure/facilitycondition.cfm

Financial Sustainability
Financial sustainability supports the economic triple bottom line sustainability principle by improving economic prosperity for current and future generations and ensuring that there are sufficient financial resources to advance the projects that help achieve broader goals of the community. *Source: FHWA Advancing a Sustainable Highway System:*

Highlights of FHWA Sustainability Activities; June 2014; Prepared by: Center for Transportation Policy and Planning, John A. Volpe National Transportations Systems Center

Glare
Light that is brighter than the brightness to which the eye is adjusted and makes seeing difficult.

Greenhouse Gas (GHG)
Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. *Source: Intergovernmental Panel on Climate Change;* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_appendix.pdf

Habitat Connectivity
The degree to which the landscape facilitates animal movement and other ecological flows. Wildlife need to move – Mobility is the key to survival for many wildlife species. *Source: Washington State Department of Transportation* http://www.wsdot.wa.gov/NR/rdonlyres/6FD6F8A9-A73D-49E5-A29B-1626B639FC7F/0/HabitatConnectivity.pdf

Habitat Fragmentation
When highways "fragment" landscapes, they divide wildlife populations into smaller, more isolated units. Smaller populations are less stable and, over time, face extinction from predators or natural causes. They may also be more susceptible to inbreeding and to genetic defects. *Source: FHWA;* http://www.fhwa.dot.gov/environment/critter_crossings/overview.cfm

Heat Island Effect
Describes built up areas that are hotter than nearby rural areas. *Source: Environmental Protection Agency;* http://www.epa.gov/heatisland/

Historic/Prehistoric Structure
A constructed work, usually immovable by nature or design, consciously created to serve some human activity. Examples include buildings and monuments, dams, millraces and canals, stockades and fences, defensive works, temple mounds and Kivas, ruins of all structural types and outdoor sculpture. Structures that are listed or determined eligible for listing in the National Register of Historic Places are considered significant. These structures may be part of the transportation system itself, such as roads, trails, retaining walls, bridges, or culverts; or they may be located in proximity to a transportation feature.

Invasive Species
"A non-native species whose introduction does, or is likely to cause, economic or environmental harm or harm to human, animal, or plant health" (Executive Order 13112, 1999). Invasive species include all taxa of species from pathogens (whirling disease) and microscopic insects, to non-native inappropriate plants (Canada thistle), mollusks (quaga and zebra mussels), to feral mammals (feral pigs). Transportation corridors including roads, paths, waterways and recreation areas are significant contributors to the spread and establishment of invasive species.

Level of Service (LOS)*
A qualitative assessment of a road's operating conditions. For local government comprehensive planning purposes, level of service means an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service indicates the capacity per unit of demand for each public facility. This term refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F. *Source: FHWA;*
http://www.fhwa.dot.gov/planning/glossary/glossary_listing.cfm?sort=definition&TitleStart=L

Light Pollution
Alteration of natural light levels in the outdoor environment by man-made sources that may degrade the utility, function, biota, or aesthetics of the surrounding environment.

Light Trespass
Light falling where it is not wanted, typically causing annoyance or disturbance.

Lightscape
Aesthetic and experiential perception of the photic environment that is integral to visitor experience and cultural resources

Low-Emitting Materials
Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants. *Source: U.S. Green Building Council;* http://www.usgbc.org/credits/schools-new-construction-healthcare/v4-draft/eqc2

Mode share
Indicates the share of the region's travel that is made by different modes of Transportation. Major Transportation modes include driving alone (single-occupancy vehicles) carpooling (high-occupancy vehicles), transit, and walking/biking. *Source: Chicago Metropolitan Agency for Planning (CMAP);* http://www.cmap.illinois.gov/about/2040/supporting-materials/process-archive/scenario-evaluation/scenario-outcomes/mode-share

Multimodal *
Facilities serving more than on transportation mode or a transportation network comprised of a variety of modes.

NAGPRA
The Native American Graves Protection and Repatriation Act, 25 USC 3001 et seq. *Source: NPS;* http://www.nps.gov/nagpra/TRAINING/GLOSSARY.HTM

Natural Lightscape
The resources and values that exist in the absence of human caused light at night such as nocturnal habitat or viewing a starry sky / the nighttime lightscape in the absence of human caused light.

Natural Resources
Materials and components that come from the environment, such as land, forests, mineral deposits, water, etc.

Noise
Sound which is unwanted, either because of its effects on humans and wildlife, or its interference with the perception or detection of other sound.

Non-Construction Waste
Debris not created during any construction, renovation or demolition project, such as visitor garbage.

Optimizer Band
Banding by score of assets in the Optimizer tool based on higher priority assets receiving higher priority funding, assets in the best condition receiving the top priority of funding, and minimal investments are made in assets in poor condition of minimal importance. API/FCI is the basis for determination:
Highest = Most Important Assets: Best Condition
High = Important Assets: Best/Good Condition
Medium = Supporting Assets: Best/Good/Fair Condition
Low = Lower Priority Assets
Lowest = Minimal Investment (API<21) & Disposal
Source: NPS Facility Management Program Glossary of Terms

Overlook
To rise above or afford a view of. *Source:* http://www.merriam-webster.com/dictionary/overlook

Photic environment
The totality of the pattern of light at night at all wavelengths in a given area, as modified by the environment.

Quiet Pavement Materials
Innovations in asphalt surface mixes have helped reduce the noise level of asphalt, making it the "quiet pavement." Quiet asphalt mixes can reduce the need for costly sound barriers. These quiet pavement technologies include open-graded surfaces, fine-graded surfaces, rubberized asphalt, and stone-matrix asphalt, which have led to noise reductions as great as 7 decibels. Reducing noise by 3 decibels is equivalent to doubling the distance from the road to the listener. And since asphalt roads tend to be quieter than other paving materials, they ultimately can lead to less driver fatigue, underlining the pavement's superior safety capabilities as well.
Source: American Asphalt Alliance; http://driveasphalt.org/noise

Quiet Technologies
The application of engineering and/or applied sciences to find practical solutions to manage and reduce roadway noise and tire-pavement noise.

RRR (3R)
Resurfacing, Restoration, and Rehabilitation

Renewable Resources
A natural resource that renews itself at a rate that is faster, or equal to the rate of consumption. Renewable resources differ from resources that once depleted never return, such as fossil fuels. Renewable resources can include perpetually sustainable resources that never run out, such as solar power, as well as renewable commodities like paper. The use and cultivation of renewable resources helps to minimize the impact humanity has on the Earth, while ensuring continued survival. *Source: Greenliving;* http://greenliving.lovetoknow.com/Examples_of_Renewable_Resources

Resiliency
Minimizing the vulnerability of transportation systems from a variety of disruptions, and adapting transportation systems to climate change impacts.

Site Selection
The process of site selection for sustainable developments is one of identifying, weighing, and balancing the attractiveness (natural and cultural environments, access) of a site against the cost inherent in its development (natural and cultural environments, access, hazards, energetics, and operations). *Source: NPS Guiding Principles of Sustainable Design September 1993 Resource Protection*

Sky Glow
Brightening of the night sky due to artificial light scattered and reflected off of air molecules and atmospheric aerosols.

Soundscape
The component of the acoustic environment that can be perceived and comprehended by the humans; the character and quality of the soundscape influence human perceptions of an area, providing a sense of place that differentiates it from other places.

Subsistence Access
To reach a destination using minimal or native means of transportation.

Total Cost of Facility Operations (TCFO):
TCFO analysis is to find the lifetime costs of acquiring and operating a facility or asset. TCFO analysis is based on the notion that there can be a large difference between the initial price of something and its long-term costs. Decisions should be based on the total cost of ownership over time, not just the initial costs. *Source: National Park Service;* http://www.nps.gov/transportation/cost_of_ownership.html

Transition Plan
Documents the steps necessary to turn the project's product or service over to the business unit and maintenance & operations support staff. The plan assures that all of the necessary steps are identified and that each of these steps has resources assigned to them. *Source: Washington State Office of the Chief Information Officer;* https://ocio.wa.gov/pmframework/initiation/planning/implementation

Travel Way Avoidance
To reduce unnecessary travel by adjusting schedules to beat high traffic volume times, or using technologies (such as teleconferences) to avoid the need for travel at all.

Universal Design Principles*
The design of products, communications, and environments to be simple and usable by people of all ages, sizes and abilities (including disabilities) without the need for special adaptations or specialized design. There are 7 principles:
1. Equitable use for any group of people
2. Flexibility - choice; adaptability to user's needs and abilities
3. Simple and intuitive to use in spite of users experience level, language skills, knowledge or concentration level
4. Perceptible information is provided regardless of user's sensory abilities or ambient conditions
5. Tolerance for error - minimal hazards and adverse consequences or accidental/unintended consequences
6. Low physical efforts required - efficient and comfortable
7. Adequate size and space for approach regardless of user's body size, posture or mobility

Viewpoint
A place affording a view of something; position of observation. *Source:* http://dictionary.reference.com/browse/viewpoint

Viewshed
The surface area visible from a given viewpoint or series of viewpoints; it is also the area from which that viewpoint may be seen. *Source: FHWA;* http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf

Visual Resources
Views of lands near the parks, monuments, and properties that are an important part of the visitor's experience. These lands may either form the "visual backdrop" for views of important landscape features, or they may be of sufficient scenic quality on their own to become an important part of visitors' scenic experiences. *Source: Argone National Laboratory;* http://visualimpact.anl.gov/evpp/

Volatile Organic Chemical Compounds (VOCs)
VOCs (any of a large class of chemical compounds whose molecules contain carbon) are everywhere in both indoor and outdoor environments because they have become essential ingredients in many products and materials. Outdoors, VOCs are volatized or released into the air mostly during manufacture or use of everyday products and materials, while indoors VOCs are mostly released into the air from the use of products and materials containing VOCs. VOCs are of concern as both indoor air pollutants and as outdoor air pollutants. However, the emphasis of that concern outdoors is different from indoors. The main concern indoors is the potential for VOCs to adversely impact the health of people that are exposed. While VOCs can also be a health concern outdoors, EPA regulates VOCs outdoors mainly because of their ability to create photochemical smog under certain conditions. Although the same term "VOC" is used

for both indoor and outdoor air quality, the term is defined differently to reflect its predominant concern in each context. This has created a misunderstanding in the marketplace and in the environmental community. In addition, the measured quantity and composition of VOCs in the air can vary significantly depending on the measurement methods used, which has generated additional confusion. *Source: Environmental Protection Agency (EPA);* http://www.epa.gov/iaq/voc2.html

Warm-Mix Asphalt
The generic name of technologies that allow the producers of hot-mix asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road.
Source: National Asphalt Pavement Association;
http://www.asphaltpavement.org/index.php?option=com_content&view=article&id=148&Itemid=329

Waste Management Plan
A plan that predicts the quantities and types of waste that will be generated during a construction, renovation or demolition project, identifies the final destination of that waste, and estimates costs. *Source: Environmental Protection Agency (EPA);*
http://www.epa.gov/region9/waste/solid/pdf/cd5.pdf

Water Resource Protection
To design and manage transportation systems to protect or restore water quality, hydrologic processes, wetlands, and floodplains. Existing roads and trails directly affect hydrologic processes by reshaping stream channels and surrounding landscape, concentrating and redirecting water flows, and modifying watershed vegetation. Streams, rivers, lakes, wetlands, oceans, and groundwater are collecting points for runoff from transportation corridors and other developed areas in watersheds. Runoff from transportation corridors carries deleterious pollutants to receiving waters and can dramatically increase frequency and magnitude of flood flows.

Wildlife/Organism Crossing
When terrestrial organisms attempt to cross roadways in order to meet life requisites.
Source: USFWS
http://www.transwildalliance.org/resources/20114211913.Pacific.Region.Roadway.Design.Guidelines.pdf

Zero Net Waste
Maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace.
Source: GrassRoots Recycling Network; http://www.grrn.org/page/what-zero-waste

NPS Park Acronyms and Unit Information

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#	**Park Name**	**Type of Unit**	**State**	**Region**	**Acronym**	**Unit**
1	Abraham Lincoln Birthplace	National Historical Park	KY	SER	ABLI	1
2	Acadia	National Park	ME	NER	ACAD	1
3	Adams	National Historical Park	MA	NER	ADAM	1
4	African American Civil War Memorial	National Memorial	DC	NCR	AFAM	0
5	African Burial Ground	National Monument	NY	NER	AFBG	1
6	Agate Fossil Beds	National Monument	NE	MWR	AGFO	1
7	Ala Kahakai	National Historic Trail	HI	PWR	ALKA	0
8	Alagnak	Wild River	AK	AKR	ALAG	1
9	Alcatraz Island	National Historic Site	CA	PWR	ALCA	0
10	Aleutian World War II	National Historic Area	AK	AKR	ALEU	0
11	Alibates Flint Quarries	National Monument	TX	IMR	ALFL	1
12	Allegheny Portage Railroad	National Historic Site	PA	NER	ALPO	1
13	American Memorial	Park	MP	PWR	AMME	0
14	Amistad	National Recreation Area	TX	IMR	AMIS	1
15	Anacostia	Park	DC	NCR	ANAC	0
16	Andersonville	National Historic Site	GA	SER	ANDE	1
17	Andrew Johnson	National Historic Site	TN	SER	ANJO	1
18	Aniakchak	National Monument & Preserve	AK	AKR	ANIA	2
19	Antietam	National Battlefield	MD	NCR	ANTI	1
20	Antietam	National Cemetery	MD	NCR	ANCM	0
21	Apostle Islands	National Lakeshore	WI	MWR	APIS	1
22	Appalachian	National Scenic Trail	CT,GA, MA,MD, ME,NC, NH,NJ, NY,PA, TN,VA, VT,WV	NER	APPA	1
23	Appomattox Court House	National Historical Park	VA	NER	APCO	1
24	Arches	National Park	UT	IMR	ARCH	1
25	Arkansas Post	National Memorial	AR	MWR	ARPO	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
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26	Arlington House, The Robert E. Lee Memorial	National Memorial	VA	NCR	ARHO	1
27	Assateague Island	National Seashore	MD,VA	NER	ASIS	1
28	Aztec Ruins	National Monument	NM	IMR	AZRU	1
29	Badlands	National Park	SD	MWR	BADL	1
30	Baltimore-Washington	Parkway	MD	NCR	BAWA	0
31	Bandelier	National Monument	NM	IMR	BAND	1
32	Battleground	National Cemetery	DC	NCR	BATT	0
33	Bent's Old Fort	National Historic Site	CO	IMR	BEOL	1
34	Bering Land Bridge	National Preserve	AK	AKR	BELA	1
35	Big Bend	National Park	TX	IMR	BIBE	1
36	Big Cypress	National Preserve	FL	SER	BICY	1
37	Big Hole	National Battlefield	MT	PWR	BIHO	1
38	Big South Fork	National River & Recreation Area	KY,TN	SER	BISO	1
39	Big Thicket	National Preserve	TX	IMR	BITH	1
40	Bighorn Canyon	National Recreation Area	MT,WY	IMR	BICA	1
41	Biscayne	National Park	FL	SER	BISC	1
42	Black Canyon Of The Gunnison	National Park	CO	IMR	BLCA	1
43	Blackstone River Valley	National Heritage Corridor	MA,RI	NER	BLAC	0
44	Blackstone River Valley	National Historical Park	MA,RI		BLRV	1
45	Blue Ridge	Parkway	NC,VA	SER	BLRI	1
46	Bluestone	National Scenic River	WV	NER	BLUE	1
47	Booker T Washington	National Monument	VA	NER	BOWA	1
48	Boston	National Historical Park	MA	NER	BOST	1
49	Boston African American	National Historic Site	MA	NER	BOAF	1
50	Boston Harbor Islands	National Recreation Area	MA	NER	BOHA	1
51	Brices Cross Roads	National Battlefield Site	MS	SER	BRCR	1
52	Brown V Board Of Education	National Historic Site	KS	MWR	BRVB	1
53	Bryce Canyon	National Park	UT	IMR	BRCA	1
54	Buck Island Reef	National Monument	VI	SER	BUIS	1
55	Buffalo	National River	AR	MWR	BUFF	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
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56	Cabrillo	National Monument	CA	PWR	CABR	1
57	California	National Historic Trail	CA,CO, ID,KS, MO,NV, OR,UT, WY	IMR	CALI	0
58	Canaveral	National Seashore	FL	SER	CANA	1
59	Cane River	National Heritage Area	LA	SER	CRHA	0
60	Cane River Creole	National Historical Park	LA	SER	CARI	1
61	Canyon De Chelly	National Monument	AZ	IMR	CACH	1
62	Canyonlands	National Park	UT	IMR	CANY	1
63	Cape Cod	National Seashore	MA	NER	CACO	1
64	Cape Hatteras	National Seashore	NC	SER	CAHA	1
65	Cape Henry Memorial	Memorial	VA	NER	CAME	0
66	Cape Krusenstern	National Monument	AK	AKR	CAKR	1
67	Cape Lookout	National Seashore	NC	SER	CALO	1
68	Capitol Hill Parks	National Park	DC	NCR	CAHE	0
69	Capitol Reef	National Park	UT	IMR	CARE	1
70	Captain John Smith Chesapeake	National Historic Trail	VA,MD, DE,DC	NER	CAJO	0
71	Capulin Volcano	National Monument	NM	IMR	CAVO	1
72	Carl Sandburg Home	National Historic Site	NC	SER	CARL	1
73	Carlsbad Caverns	National Park	NM	IMR	CAVE	1
74	Carter G. Woodson Home	National Historic Site	DC	NCR	CAWO	1
75	Casa Grande Ruins	National Monument	AZ	IMR	CAGR	1
76	Castillo De San Marcos	National Monument	FL	SER	CASA	1
77	Castle Clinton	National Monument	NY	NER	CACL	1
78	Catoctin Mountain	Park	MD	NCR	CATO	1
79	Cedar Breaks	National Monument	UT	IMR	CEBR	1
80	Cedar Creek & Belle Grove	National Historical Park	VA	NER	CEBE	1
81	César E. Chávez	National Monument	CA	PWR	CECH	1
82	Chaco Culture	National Historical Park	NM	IMR	CHCU	1
83	Chamizal	National Memorial	TX	IMR	CHAM	1
84	Channel Islands	National Park	CA	PWR	CHIS	1
85	Charles Pinckney	National Historic Site	SC	SER	CHPI	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
86	Charles Young Buffalo Soldiers	National Monument	OH	MWR	CHYO	1
87	Chattahoochee River	National Recreation Area	GA	SER	CHAT	1
88	Chesapeake & Ohio Canal	National Historical Park	DC,MD, WV	NCR	CHOH	1
89	Chesapeake Bay	Gateways and Watertrails Network	DE, DC, MD, NY, PA, VA, WV		CBGN	0
90	Chesapeake Bay Gateways Network	Gateways Network	DC,MD, PA,VA, WV	NER	CBPO	0
91	Chickamauga & Chattanooga	National Military Park	GA	SER	CHCH	1
92	Chickasaw	National Recreation Area	OK	IMR	CHIC	1
93	Chimney Rock	National Historic Site	NE	MWR	CHRO	0
94	Chiricahua	National Monument	AZ	IMR	CHIR	1
95	Christiansted	National Historic Site	VI	SER	CHRI	1
96	City Of Rocks	National Reserve	ID	PWR	CIRO	1
97	Clara Barton	National Historic Site	MD	NCR	CLBA	1
98	Claude Moore Colonial Farm	National Historic Site	VA	NCR	CLMO	0
99	Colonial	National Historical Park	VA	NER	COLO	1
100	Colorado	National Monument	CO	IMR	COLM	1
101	Congaree	National Park	SC	SER	COSW	1
102	Constitution Gardens	National Park	DC	NCR	COGA	1
103	Coronado	National Memorial	AZ	IMR	CORO	1
104	Cowpens	National Battlefield	SC	SER	COWP	1
105	Crater Lake	National Park	OR	PWR	CRLA	1
106	Craters Of The Moon	National Monument & Preserve	ID	PWR	CRMO	2
107	Cumberland Gap	National Historical Park	KY,TN, VA	SER	CUGA	1
108	Cumberland Island	National Seashore	GA	SER	CUIS	1
109	Curecanti	National Recreation Area	CO	IMR	CURE	1
110	Cuyahoga Valley	National Park	OH	MWR	CUVA	1
111	David Berger	National Memorial	OH	MWR	DABE	0

#	Park Name	Type of Unit	State	Region	Acronym	Unit
112	Dayton Aviation Heritage	National Historical Park	OH	MWR	DAAV	1
113	De Soto	National Memorial	FL	SER	DESO	1
114	Death Valley	National Park	CA	PWR	DEVA	1
115	Delaware	National Scenic River	PA	NER	DELA	1
116	Delaware & Lehigh	National Heritage Corridor	PA	NER	DELE	0
117	Delaware Water Gap	National Recreation Area	PA	NER	DEWA	1
118	Denali	National Park & Preserve	AK	AKR	DENA	2
119	Deshler-Morris House	National Historic Site	PA	NER	DEMO	0
120	Devils Postpile	National Monument	CA	PWR	DEPO	1
121	Devils Tower	National Monument	WY	IMR	DETO	1
122	Dinosaur	National Monument	CO,UT	IMR	DINO	1
123	Dry Tortugas	National Park	FL	SER	DRTO	1
124	Ebey's Landing	National Historical Reserve	WA	PWR	EBLA	1
125	Edgar Allan Poe	National Historic Site	PA	NER	EDAL	1
126	Effigy Mounds	National Monument	IA	MWR	EFMO	1
127	Eisenhower	National Historic Site	PA	NER	EISE	1
128	El Camino Real de los Tejas	National Historic Trail	TX	IMR	ELTE	0
129	El Camino Real de Tierra Adentro	National Historic Trail	NM,TX	IMR	ELCA	0
130	El Malpais	National Monument	NM	IMR	ELMA	1
131	El Morro	National Monument	NM	IMR	ELMO	1
132	Eleanor Roosevelt	National Historic Site	NY	NER	ELRO	1
133	Ellis Island	National Monument	NJ,NY	NER	ELIS	0
134	Erie Canalway	National Heritage Corridor	NY	NER	ERIE	0
135	Essex	National Heritage Area	MA	NER	ESSE	0
136	Eugene O'Neill	National Historic Site	CA	PWR	EUON	1
137	Everglades	National Park	FL	SER	EVER	1
138	Father Marquette	National Memorial	MI	MWR	FAMA	0
139	Federal Hall	National Memorial	NY	NER	FEHA	1
140	Fire Island	National Seashore	NY	NER	FIIS	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
141	First Ladies	National Historic Site	OH	MWR	FILA	1
142	First State	National Historical Park	DE	NER	FRST	1
143	Flight 93	National Memorial	PA	NER	FLNI	1
144	Florissant Fossil Beds	National Monument	CO	IMR	FLFO	1
145	Ford's Theatre	National Historic Site	DC	NCR	FOTH	1
146	Fort Bowie	National Historic Site	AZ	IMR	FOBO	1
147	Fort Caroline	National Memorial	FL	SER	FOCA	1
148	Fort Davis	National Historic Site	TX	IMR	FODA	1
149	Fort Donelson	National Battlefield	TN	SER	FODO	1
150	Fort Donelson	National Cemetery	TN	SER	FDNC	0
151	Fort Dupont Park	National Park	DC	NCR	FODU	0
152	Fort Foote	National Park	MD	NCR	FOFO	0
153	Fort Frederica	National Monument	GA	SER	FOFR	1
154	Fort Laramie	National Historic Site	WY	IMR	FOLA	1
155	Fort Larned	National Historic Site	KS	MWR	FOLS	1
156	Fort Matanzas	National Monument	FL	SER	FOMA	1
157	Fort McHenry	National Monument and Historic Shrine	MD	NER	FOMC	1
158	Fort Monroe	National Monument	VA	NER	FOMR	1
159	Fort Necessity	National Battlefield	PA	NER	FONE	1
160	Fort Point	National Historic Site	CA	PWR	FOPO	1
161	Fort Pulaski	National Monument	GA	SER	FOPU	1
162	Fort Raleigh	National Historic Site	NC	SER	FORA	1
163	Fort Scott	National Historic Site	KS	MWR	FOSC	1
164	Fort Smith	National Historic Site	AR,OK	MWR	FOSM	1
165	Fort Stanwix	National Monument	NY	NER	FOST	1
166	Fort Sumter	National Monument	SC	SER	FOSU	1
167	Fort Union	National Monument	NM	IMR	FOUN	1
168	Fort Union Trading Post	National Historic Site	ND	MWR	FOUS	1
169	Fort Vancouver	National Historic Site	WA	PWR	FOVA	1
170	Fort Washington	Park	MD	NCR	FOWA	1
171	Fossil Butte	National Monument	WY	IMR	FOBU	1

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#	Park Name	Type of Unit	State	Region	Acronym	Unit
172	Franklin Delano Roosevelt	Memorial	DC	NCR	FRDE	1
173	Frederick Douglass	National Historic Site	DC	NCR	FRDO	1
174	Frederick Law Olmsted	National Historic Site	MA	NER	FRLA	1
175	Fredericksburg	National Cemetery	VA	NER	FRED	0
176	Fredericksburg & Spotsylvania	National Military Park	VA	NER	FRSP	1
177	Friendship Hill	National Historic Site	PA	NER	FRHI	1
178	Gates Of The Arctic	National Park & Preserve	AK	AKR	GAAR	2
179	Gateway	National Recreation Area	NY,NJ	NER	GATE	1
180	Gauley River	National Recreation Area	WV	NER	GARI	1
181	General Grant	National Memorial	NY	NER	GEGR	1
182	George Mason	National Memorial	DC	NCR	GEMM	0
183	George Rogers Clark	National Historical Park	IN	MWR	GERO	1
184	George Washington	Memorial Parkway	DC	NCR	GWMP	1
185	George Washington Birthplace	National Monument	VA	NER	GEWA	1
186	George Washington Carver	National Monument	MO	MWR	GWCA	1
187	Gettysburg	National Military Park	PA	NER	GETT	1
188	Gettysburg	National Cemetery	PA	NER	GETC	0
189	Gila Cliff Dwellings	National Monument	NM	IMR	GICL	1
190	Glacier	National Park	MT	IMR	GLAC	1
191	Glacier Bay	National Park & Preserve	AK	AKR	GLBA	2
192	Glen Canyon	National Recreation Area	AZ,UT	IMR	GLCA	1
193	Glen Echo	National Park	MD	NCR	GLEC	0
194	Gloria Dei Church	National Historic Site	PA	NER	GLDE	0
195	Golden Gate	National Recreation Area	CA	PWR	GOGA	1
196	Golden Spike	National Historic Site	UT	IMR	GOSP	1
197	Governors Island	National Monument	NY	NER	GOIS	1
198	Grand Canyon	National Park	AZ	IMR	GRCA	1
199	Grand Portage	National Monument	MN	MWR	GRPO	1
200	Grand Teton	National Park	WY	IMR	GRTE	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
201	Grant-Kohrs Ranch	National Historic Site	MT	IMR	GRKO	1
202	Great Basin	National Park	NV	PWR	GRBA	1
203	Great Egg Harbor River	Wild River	NJ	NER	GREG	1
204	Great Falls	National Park	VA	NCR	GRFA	0
205	Great Sand Dunes	National Park & Preserve	CO	IMR	GRSA	2
206	Great Smoky Mountains	National Park	TN,NC	SER	GRSM	1
207	Green Springs	National Historic Landmark District	VA	NER	GRSP	0
208	Greenbelt	National Park	MD	NCR	GREE	1
209	Guadalupe Mountains	National Park	TX	IMR	GUMO	1
210	Guilford Courthouse	National Military Park	NC	SER	GUCO	1
211	Gulf Islands	National Seashore	FL,MS	SER	GUIS	1
212	Hagerman Fossil Beds	National Monument	ID	PWR	HAFO	1
213	Haleakala	National Park	HI	PWR	HALE	1
214	Hamilton Grange	National Memorial	NY	NER	HAGR	1
215	Hampton	National Historic Site	MD	NER	HAMP	1
216	Harmony Hall	National Historic Site	MD	NCR	HAHA	0
217	Harpers Ferry	National Historical Park	WV	NCR	HAFE	1
218	Harriet Tubman Underground Railroad	National Historical Park	MDL	NER	HATU	1
219	Harry S Truman	National Historic Site	MO	MWR	HSTR	1
220	Hawaii Volcanoes	National Park	HI	PWR	HAVO	1
221	Herbert Hoover	National Historic Site	IA	MWR	HEHO	1
222	Hohokam Pima	National Monument	AZ	IMR	PIMA	1
223	Home Of Franklin D Roosevelt	National Historic Site	NY	NER	HOFR	1
224	Homestead	National Monument of America	NE	MWR	HOME	1
225	Honouliuli	National Monument	HI		HONO	1
226	Hopewell Culture	National Historical Park	OH	MWR	HOCU	1
227	Hopewell Furnace	National Historic Site	PA	NER	HOFU	1
228	Horseshoe Bend	National Military Park	AL	SER	HOBE	1
229	Hot Springs	National Park	AR	MWR	HOSP	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
230	Hovenweep	National Monument	UT	IMR	HOVE	1
231	Hubbell Trading Post	National Historic Site	AZ	IMR	HUTR	1
232	Ice Age	National Scenic Trail	WI	MWR	IATR	0
233	Illinois & Michigan Canal	National Heritage Corridor	IL	MWR	ILMI	0
234	Independence	National Historical Park	PA	NER	INDE	1
235	Indiana Dunes	National Lakeshore	IN	MWR	INDU	1
236	Inupiat Heritage Center	National Heritage Center	AK	AKR	INUP	0
237	Isle Royale	National Park	MI	MWR	ISRO	1
238	James A Garfield	National Historic Site	OH	MWR	JAGA	1
239	Jamestown	National Historic Site	VA	NER	JAME	0
240	Jean Lafitte	National Historical Park and Preserve	LA	SER	JELA	1
241	Jefferson	National Expansion Memorial	MO	MWR	JEFF	1
242	Jewel Cave	National Monument	SD	MWR	JECA	1
243	Jimmy Carter	National Historic Site	GA	SER	JICA	1
244	John D Rockefeller Jr	Memorial Parkway	WY	IMR	JODR	1
245	John Day Fossil Beds	National Monument	OR	PWR	JODA	1
246	John Ericsson	National Memorial	DC	NCR	JOER	0
247	John F Kennedy	National Historic Site	MA	NER	JOFI	1
248	John Muir	National Historic Site	CA	PWR	JOMU	1
249	Johnstown Flood	National Memorial	PA	NER	JOFL	1
250	Joshua Tree	National Park	CA	PWR	JOTR	1
251	Juan Bautista de Anza	National Historic Trail	CA	PWR	JUBA	0
252	Kalaupapa	National Historical Park	HI	PWR	KALA	1
253	Kaloko-Honokohau	National Historical Park	HI	PWR	KAHO	1
254	Katmai	National Park & Preserve	AK	AKR	KATM	2
255	Kenai Fjords	National Park	AK	AKR	KEFJ	1
256	Kenilworth Park & Aquatic Gardens	National Park	DC	NCR	KEPA	0

#	Park Name	Type of Unit	State	Region	Acronym	Unit
257	Kennesaw Mountain	National Battlefield Park	GA	SER	KEMO	1
258	Keweenaw	National Historical Park	MI	MWR	KEWE	1
259	Kings Mountain	National Military Park	SC	SER	KIMO	1
260	Klondike Gold Rush	National Historical Park	AK	AKR	KLGO	1
261	Klondike Gold Rush - Seattle Unit	National Historical Park	WA	PWR	KLSE	0
262	Knife River Indian Villages	National Historic Site	ND	MWR	KNRI	1
263	Kobuk Valley	National Park	AK	AKR	KOVA	1
264	Korean War Veterans	Memorial	DC	NCR	KOWA	1
265	Lake Chelan	National Recreation Area	WA	PWR	LACH	1
266	Lake Clark	National Park & Preserve	AK	AKR	LACL	2
267	Lake Mead	National Recreation Area	AZ,NV	PWR	LAKE	1
268	Lake Meredith	National Recreation Area	TX	IMR	LAMR	1
269	Lake Roosevelt	National Recreation Area	WA	PWR	LARO	1
270	Lassen Volcanic	National Park	CA	PWR	LAVO	1
271	Lava Beds	National Monument	CA	PWR	LABE	1
272	Lewis and Clark	National Historical Park	OR	PWR	LEWI	1
273	Lewis and Clark	National Historic Trail	IA,ID,IL, KS,MO, MT,ND, NE,OR, SD,WA	MWR	LECL	0
274	Lincoln	Memorial	DC	NCR	LINC	1
275	Lincoln Boyhood	National Memorial	IN	MWR	LIBO	1
276	Lincoln Home	National Historic Site	IL	MWR	LIHO	1
277	Little Bighorn Battlefield	National Monument	MT	IMR	LIBI	1
278	Little River Canyon	National Preserve	AL	SER	LIRI	1
279	Little Rock Central High School	National Historic Site	AR	MWR	CHSC	1
280	Longfellow	National Historic Site	MA	NER	LONG	1
281	Lowell	National Historical Park	MA	NER	LOWE	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
282	Lower East Side Tenement Museum	National Historic Site	NY	NER	LOEA	0
283	Lyndon B Johnson	National Historical Park	TX	IMR	LYJO	1
284	Lyndon Baines Johnson Memorial Grove on the Potomac	National Memorial	VA	NCR	LYBA	1
285	Maggie L Walker	National Historic Site	VA	NER	MAWA	1
286	Maine Acadian Culture	National Heritage Center	ME	NER	MAAC	0
287	Mammoth Cave	National Park	KY	SER	MACA	1
288	Manassas	National Battlefield Park	VA	NCR	MANA	1
289	Manhattan Project	National Historical Park		IMR	MAPR	1
290	Manhattan Sites	National Historic Sites	NY	NER	MASI	0
291	Manzanar	National Historic Site	CA	PWR	MANZ	1
292	Marsh - Billings - Rockefeller	National Historical Park	VT	NER	MABI	1
293	Martin Luther King Jr	National Historic Site	GA	SER	MALU	1
294	Martin Luther King, Jr.	Memorial		NCR	MLKM	1
295	Martin Van Buren	National Historic Site	NY	NER	MAVA	1
296	Mary McLeod Bethune Council House	National Historic Site	DC	NCR	MAMC	1
297	Mcloughlin House	National Historic Site	OR	PWR	MCHO	0
298	Mesa Verde	National Park	CO	IMR	MEVE	1
299	Minidoka	National Historic Site	ID	PWR	MIIN	1
300	Minute Man	National Historical Park	MA	NER	MIMA	1
301	Minuteman Missile	National Historic Site	SD	MWR	MIMI	1
302	Mississippi	National River & Recreation Area	MN	MWR	MISS	1
303	Missouri	National Recreational River	SD	MWR	MNRR	1
304	Mojave	National Preserve	CA	PWR	MOJA	1
305	Monocacy	National Battlefield	MD	NCR	MONO	1
306	Montezuma Castle	National Monument	AZ	IMR	MOCA	1

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307	Moores Creek	National Battlefield	NC	SER	MOCR	1
308	Mormon Pioneer	National Historic Trail	IA,IL,NE UT,WY	IMR	MOPI	0
309	Morristown	National Historical Park	NJ	NER	MORR	1
310	Mount Rainier	National Park	WA	PWR	MORA	1
311	Mount Rushmore	National Memorial	SD	MWR	MORU	1
312	Muir Woods	National Monument	CA	PWR	MUWO	1
313	Natchez	National Historical Park	MS	SER	NATC	1
314	Natchez Trace	Parkway	AL,MS, TN	SER	NATR	2
315	Natchez Trace	National Scenic Trail	MS,TN	SER	NATT	0
316	National Capital Parks-East	National Park	DC	NCR	NACE	0
317	National Mall	National Park	DC	NCR	NAMA	1
318	National Mall & Memorial Parks	National Park	DC	NCR	NACC	1
319	National Park of American Samoa	National Park	AS	PWR	NPSA	1
320	National Parks of New York Harbor	National Park	NY	NER	NPNH	0
321	National World War II	Memorial	DC	NCR	NWWM	1
322	Natural Bridges	National Monument	UT	IMR	NABR	1
323	Navajo	National Monument	AZ	IMR	NAVA	1
324	New Bedford Whaling	National Historical Park	MA	NER	NEBE	1
325	New England	National Scenic Trail	CT,MA	NER	NEEN	0
326	New Jersey Coastal Heritage Trail Route	National Scenic Trail	NJ	NER	NEJE	0
327	New Jersey Pinelands	National Reserve	NJ	NER	PINE	0
328	New Orleans Jazz	National Historical Park	LA	SER	JAZZ	1
329	New River Gorge	National River	WV	NER	NERI	1
330	Nez Perce	National Historical Park	ID,MT, OR,WA	PWR	NEPE	1
331	Niagara Falls	National Heritage Area	NY	NER	NIFA	0
332	Nicodemus	National Historic Site	KS	MWR	NICO	1
333	Ninety Six	National Historic Site	SC	SER	NISI	1

#	Park Name	Type of Unit	State	Region	Acronym	Unit
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334	Niobrara	National Scenic River	NE	MWR	NIOB	1
335	Noatak	National Preserve	AK	AKR	NOAT	1
336	North Cascades	National Park	WA	PWR	NOCA	1
337	North Country	National Scenic Trail	MI,MN, ND,NY, OH,PA, WI	MWR	NOCO	0
338	Obed	Wild & Scenic River	TN	SER	OBED	1
339	Ocmulgee	National Monument	GA	SER	OCMU	1
340	Oklahoma City	National Memorial	OK	IMR	OKCI	0
341	Old Post Office Tower	National Historic Site	DC	NCR	OPOT	0
342	Old Spanish	National Historic Trail	NM,CO, UT,AZ, NV,CA	PWR	OLSP	0
343	Olympic	National Park	WA	PWR	OLYM	1
344	Oregon	National Historic Trail	ID,KS, MO,NE, OR,WY	IMR	OREG	0
345	Oregon Caves	National Monument & Preserve	OR	PWR	ORCA	1
346	Organ Pipe Cactus	National Monument	AZ	IMR	ORPI	1
347	Overmountain Victory	National Historic Trail	NC,SC, TN,VA	SER	OVVI	0
348	Oxon Cove Park & Oxon Hill Farm	National Historic District	MD	NCR	OXHI	0
349	Ozark	National Scenic Riverways	MO	MWR	OZAR	1
350	Padre Island	National Seashore	TX	IMR	PAIS	1
351	Palo Alto Battlefield	National Historical Park	TX	IMR	PAAL	1
352	Parashant	National Monument	AZ	PWR	PARA	0
353	Paterson Great Falls	National Historical Park	NJ	NER	PAGR	1
354	Pea Ridge	National Military Park	AR	MWR	PERI	1
355	Pecos	National Historical Park	NM	IMR	PECO	1
356	Peirce Mill	National Historic Site	DC	NCR	PIMI	0
357	Pennsylvania Avenue	National Historic Site	DC	NCR	PAAV	1
358	Perry's Victory & International Peace	Memorial	OH	MWR	PEVI	1

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359	Petersburg	National Battlefield	VA	NER	PETE	1
360	Petrified Forest	National Park	AZ	IMR	PEFO	1
361	Petroglyph	National Monument	NM	IMR	PETR	1
362	Pictured Rocks	National Lakeshore	MI	MWR	PIRO	1
363	Pinnacles	National Park	CA	PWR	PINN	1
364	Pipe Spring	National Monument	AZ	IMR	PISP	1
365	Pipestone	National Monument	MN	MWR	PIPE	1
366	Piscataway	National Park	MD	NCR	PISC	1
367	Point Reyes	National Seashore	CA	PWR	PORE	1
368	Pony Express	National Historic Trail	CA,CO, KS,MO, NV,UT, WY	IMR	POEX	0
369	Poplar Grove	National Cemetery	VA	NER	POGR	0
370	Port Chicago Naval Magazine	National Memorial	CA	PWR	POCH	1
371	Potomac Heritage	National Scenic Trail	DC,MD, PA,VA	NCR	POHE	1
372	Poverty Point	National Monument	LA	SER	POPO	1
373	President William Jefferson Clinton Birthplace Home	National Historic Site	AR	MWR	WICL	1
374	President's Park (White House)	National Park	DC	NCR	WHHO	1
375	Presidio of San Francisco	National Historic Park	CA	PWR	PRSF	0
376	Prince William Forest	National Park	VA	NCR	PRWI	1
377	Pu`uhonua O Honaunau	National Historical Park	HI	PWR	PUHO	1
378	Pullman	National Monument	IL	MWR	PULL	1
379	Puukohola Heiau	National Historic Site	HI	PWR	PUHE	1
380	Quinebaug & Shetucket Rivers Valley	National Heritage Corridor	CT	NER	QUSH	0
381	Rainbow Bridge	National Monument	UT	IMR	RABR	1
382	Redwood	National and State Parks	CA	PWR	REDW	1
383	Richmond	National Battlefield Park	VA	NER	RICH	1
384	Rio Grande	Wild & Scenic River	TX	IMR	RIGR	1
385	River Raisin	National Battlefield	MI	MWR	RIRA	1
386	Rock Creek	Park	DC	NCR	ROCR	1
387	Rocky Mountain	National Park	CO	IMR	ROMO	1

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388	Roger Williams	National Memorial	RI	NER	ROWI	1
389	Roosevelt Campobello	International Park	ME	NER	ROCA	0
390	Rosie the Riveter WWII Home Front	National Historical Park	CA	PWR	RORI	1
391	Ross Lake	National Recreation Area	WA	PWR	ROLA	1
392	Russell Cave	National Monument	AL	SER	RUCA	1
393	Sagamore Hill	National Historic Site	NY	NER	SAHI	1
394	Saguaro	National Park	AZ	IMR	SAGU	1
395	Saint Croix	National Scenic Riverway	WI	MWR	SACN	1
396	Saint Croix Island	International Historic Site	ME	NER	SACR	1
397	Saint Paul's Church	National Historic Site	NY	NER	SAPA	1
398	Saint-Gaudens	National Historic Site	NH	NER	SAGA	1
399	Salem Maritime	National Historic Site	MA	NER	SAMA	1
400	Salinas Pueblo Missions	National Monument	NM	IMR	SAPU	1
401	Salt River Bay	National Historic Park and Ecological Preserve	VI	SER	SARI	1
402	San Antonio Missions	National Historical Park	TX	IMR	SAAN	1
403	San Francisco Maritime	National Historical Park	CA	PWR	SAFR	1
404	San Juan	National Historic Site	PR	SER	SAJU	1
405	San Juan Island	National Historical Park	WA	PWR	SAJH	1
406	Sand Creek Massacre	National Historic Site	CO	IMR	SAND	1
407	Santa Fe	National Historic Trail	CO,KS, MO,NM, OK	IMR	SAFE	0
408	Santa Monica Mountains	National Recreation Area	CA	PWR	SAMO	1
409	Saratoga	National Historical Park	NY	NER	SARA	1
410	Saugus Iron Works	National Historic Site	MA	NER	SAIR	1
411	Scotts Bluff	National Monument	NE	MWR	SCBL	1
412	Selma To Montgomery	National Historic Trail	AL	SER	SEMO	0
413	Sequoia & Kings Canyon	National Parks	CA	PWR	SEKI	2

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414	Sewall-Belmont House	National Historic Site	DC	NCR	SEBE	0
415	Shenandoah	National Park	VA	NER	SHEN	1
416	Shiloh	National Military Park	TN	SER	SHIL	1
417	Shiloh	National Cemetery	TN	SER	SHNC	0
418	Sitka	National Historical Park	AK	AKR	SITK	1
419	Sleeping Bear Dunes	National Lakeshore	MI	MWR	SLBE	1
420	Springfield Armory	National Historic Site	MA	NER	SPAR	1
421	Star-Spangled Banner	National Historic Trail	VA,DC, MD	NER	STSP	0
422	Statue Of Liberty	National Monument	NY	NER	STLI	1
423	Steamtown	National Historic Site	PA	NER	STEA	1
424	Stones River	National Battlefield	TN	SER	STRI	1
425	Stones River	National Cemetery	TN	SER	SRNC	0
426	Suitland	Parkway	MD	NCR	SUIT	0
427	Sunset Crater Volcano	National Monument	AZ	IMR	SUCR	1
428	Tallgrass Prairie	National Preserve	KS	MWR	TAPR	1
429	Thaddeus Kosciuszko	National Memorial	PA	NER	THKO	1
430	The Old Stone House	National Historic Site	DC	NCR	OLST	0
431	Theodore Roosevelt	National Park	ND	MWR	THRO	1
432	Theodore Roosevelt Birthplace	National Historic Site	NY	NER	THRB	1
433	Theodore Roosevelt Inaugural	National Historic Site	NY	NER	THRI	1
434	Theodore Roosevelt Island	Park	VA	NCR	THIS	1
435	Thomas Edison	National Historical Park	NJ	NER	EDIS	1
436	Thomas Jefferson	Memorial	DC	NCR	THJE	1
437	Thomas Stone	National Historic Site	MD	NER	THST	1
438	Timpanogos Cave	National Monument	UT	IMR	TICA	1
439	Timucuan	Ecological & Historic Preserve	FL	SER	TIMU	1
440	Tonto	National Monument	AZ	IMR	TONT	1
441	Touro Synagogue	National Historic Site	RI	NER	TOSY	0

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442	Trail Of Tears	National Historic Trail	AL,AR, GA,IL, KY,MO, NC,OK, TN	IMR	TRTE	0
443	Tule Springs Fossil Beds	National Monument	NV		TUSK	1
444	Tumacácori	National Historical Park	AZ	IMR	TUMA	1
445	Tupelo	National Battlefield	MS	SER	TUPE	1
446	Tuskegee Airmen	National Historic Site	AL	SER	TUAI	1
447	Tuskegee Institute	National Historic Site	AL	SER	TUIN	1
448	Tuzigoot	National Monument	AZ	IMR	TUZI	1
449	U S S Arizona	Memorial	HI	PWR	USAR	0
450	Ulysses S Grant	National Historic Site	MO	MWR	ULSG	1
451	Upper Delaware	Scenic & Recreational River	NY,PA	NER	UPDE	1
452	Valles Caldera	National Preserve	NM		VALL	1
453	Valley Forge	National Historical Park	PA	NER	VAFO	1
454	Vanderbilt Mansion	National Historic Site	NY	NER	VAMA	1
455	Vicksburg	National Military Park	MS	SER	VICK	1
456	Vicksburg	National Cemetery	MS	SER	VINC	0
457	Vietnam Veterans	Memorial	DC	NCR	VIVE	1
458	Virgin Islands	National Park	VI	SER	VIIS	1
459	Virgin Islands Coral Reef	National Monument	VI	SER	VICR	1
460	Voyageurs	National Park	MN	MWR	VOYA	1
461	Waco Mammoth	National Monument	TX	IMR	WACO	1
462	Walnut Canyon	National Monument	AZ	IMR	WACA	1
463	War In The Pacific	National Historical Park	GU	PWR	WAPA	1
464	Washington	Monument	DC	NCR	WASH	1
465	Washita Battlefield	National Historic Site	OK	IMR	WABA	1
466	Weir Farm	National Historic Site	CT	NER	WEFA	1
467	Western Arctic National Parklands	National Park & Preserve	AK	AKR	NWAK	0
468	Whiskeytown	National Recreation Area	CA	PWR	WHIS	1
469	White Sands	National Monument	NM	IMR	WHSA	1

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470	Whitman Mission	National Historic Site	WA	PWR	WHMI	1
471	William Howard Taft	National Historic Site	OH	MWR	WIHO	1
472	Wilson's Creek	National Battlefield	MO	MWR	WICR	1
473	Wind Cave	National Park	SD	MWR	WICA	1
474	Wolf Trap National Park for the Performing Arts	National Park	VA	NCR	WOTR	1
475	Women's Rights	National Historical Park	NY	NER	WORI	1
476	World War II Valor in the Pacific	National Monument	HI	PWR	VALR	1
477	Wrangell - St Elias	National Park & Preserve	AK	AKR	WRST	2
478	Wright Brothers	National Memorial	NC	SER	WRBR	1
479	Wupatki	National Monument	AZ	IMR	WUPA	1
480	Yellowstone	National Park	ID,MT, WY	IMR	YELL	1
481	Yorktown	National Cemetery	VA	NER	YORK	0
482	Yorktown Battlefield	National Battlefield	VA	NER	YONB	0
483	Yosemite	National Park	CA	PWR	YOSE	1
484	Yucca House	National Monument	CO	IMR	YUHO	1
485	Yukon - Charley Rivers	National Preserve	AK	AKR	YUCH	1
486	Zion	National Park	UT	IMR	ZION	1